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GenCore version 5.1.6

OM nucleic - nucleic search, using sw model

Run on: June 17, 2003, 11:16:03 ; Search time 253.713 Seconds
(without alignments)
10331.847 Million cell updates/sec

Title: US-09-807-933B-10
Perfect score: 1164
Sequence: 1 atgaagttcaccgttgctat.....caggttgcgaaagaaagtaa 1164

Scoring table: IDENTITY_NUC
Gapop 10.0 , Gapext 1.0

Searched: 2185239 seqs, 1125999159 residues

Total number of hits satisfying chosen parameters: 4370478

Minimum DB seq length: 0
Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries

Database : N_Geneseq_101002:*
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2: /SIDS2/gcgdata/geneseq/geneseqn-embl/NA1981.DAT:*
3: /SIDS2/gcgdata/geneseq/geneseqn-embl/NA1982.DAT:*
4: /SIDS2/gcgdata/geneseq/geneseqn-embl/NA1983.DAT:*
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23: /SIDS2/gcgdata/geneseq/geneseqn-embl/NA2001B.DAT:*
24: /SIDS2/gcgdata/geneseq/geneseqn-embl/NA2002.DAT:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	% Query Match	Length	DB	ID	Description
1	1164	100.0	1164	21	AAA62730	Endoglucanase nucl
2	1164	100.0	1164	24	AAL43248	Rhizopus arrhizus
3	940	80.8	1017	21	AAA62729	Endoglucanase nucl
4	940	80.8	1017	24	AAL43247	Rhizopus arrhizus
5	413	35.5	1017	21	AAA62726	Endoglucanase nucl
6	413	35.5	1017	24	AAL43244	Rhizopus arrhizus
7	398.6	34.2	1083	21	AAA62728	Endoglucanase nucl
8	398.6	34.2	1083	24	AAL43246	Rhizopus arrhizus
9	390.2	33.5	1101	21	AAA62727	Endoglucanase nucl
10	390.2	33.5	1101	24	AAL43245	Rhizopus arrhizus
11	382.8	32.9	1041	21	AAA62731	Endoglucanase nucl
12	382.8	32.9	1041	24	AAL43249	Phycomyces nitens
13	283.4	24.3	1043	21	AAA62732	Endoglucanase nucl
14	283.4	24.3	1043	24	AAL43250	Rhizopus arrhizus
15	221.4	19.0	984	19	AAV16105	Fusarium oxysporum
16	221.4	19.0	1473	12	AAQ14857	Fusarium oxysporum
17	221.4	19.0	1473	13	AAQ26407	Fusarium oxysporum
18	221.4	19.0	1473	13	AAQ26382	Endoglucanase #2.
19	221.4	19.0	1473	13	AAQ25933	Cellulase containe
20	221.4	19.0	1473	13	AAQ29935	Endoglucanase gene
21	221.4	19.0	1473	14	AAQ49942	Endoglucanase enzy
22	221.4	19.0	1473	16	AAZ60179	F. oxysporum endog
23	221.4	19.0	1473	19	AAV16103	Fusarium oxysporum
24	219.8	18.9	1473	14	AAQ41733	Dye transfer inhib
25	207.4	17.8	1423	17	AAT39049	cDNA encoding cell
26	204	17.5	915	19	AAV15075	Hybrid DNA compris
27	202.8	17.4	922	19	AAV15073	Hybrid DNA compris
28	200.6	17.2	928	19	AAV15074	Hybrid DNA compris
29	188	16.2	925	19	AAV15076	Hybrid DNA compris
30	187.6	16.1	672	24	AAL43263	Humicola insolens
31	187.6	16.1	672	24	AAI69425	Humicola insolens
32	186.8	16.0	922	19	AAV15072	Hybrid DNA compris
33	186	16.0	1154	17	AAT39048	cDNA encoding cell
34	184	15.8	1174	17	AAT39050	cDNA encoding cell
35	184	15.8	1174	19	AAV39096	Monocomponent endo
36	181	15.5	807	19	AAV16104	Humicola insolens
37	179.4	15.4	1058	13	AAQ26405	Humicola insolens
38	179.4	15.4	1060	12	AAQ14856	Humicola insolens
39	179.4	15.4	1060	13	AAQ26380	Endoglucanase #1.
40	179.4	15.4	1060	13	AAQ25932	Cellulase containe
41	179.4	15.4	1060	13	AAQ29934	Endoglucanase gene
42	179.4	15.4	1060	13	AAQ30067	Sequence encoding
43	179.4	15.4	1060	14	AAQ41732	Dye transfer inhib
44	179.4	15.4	1060	14	AAQ49941	Endoglucanase enzy
45	179.4	15.4	1060	16	AAZ60178	H. insolens endogl

ALIGNMENTS

RESULT 1
AAA62730
ID AAA62730 standard; DNA; 1164 BP.
XX
AC AAA62730;
XX
DT 25-SEP-2000 (first entry)
XX
DE Endoglucanase nucleotide sequence 5.
XX
KW Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KW animal foodstuff; ss.
XX
OS Mucor circinelloides.
XX
PN WO200024879-A1.
XX
PD 04-MAY-2000.
XX
PF 25-OCT-1999; 99WO-JP05884.
XX
PR 23-OCT-1998; 98JP-0302387.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;
PI Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;
XX
DR WPI; 2000-365117/31.
DR P-PSDB; AAB09825.
XX
PT Endoglucanases of fungal origin with high activity under alkaline

PT conditions for production of paper pulp and animal feedstuffs -
XX
PS Claim 44; Page 122-124; 180pp; Japanese.
XX
CC This sequence encodes an endoglucanase protein. The invention relates
CC to an endoglucanase of fungal origin which can completely break down
CC purified cellulose at a concentration of less than 1mg protein/litre,
CC and produces more than 50% breakdown of cellulose at pH 8.5. The
CC invention includes endoglucanase protein sequences (see
CC AAB09825-B09830), endoglucanase nucleotide sequences (see
CC AAA62726-A62732) and primers (AAA62733-A62802) which are used in the
CC identification of the endoglucanase sequences, and in the construction of
CC vectors containing the polynucleotides. The endoglucanase enzymes are
CC used for the production of pulp for papermaking and for the production of
CC animal foodstuffs.
XX
SQ Sequence 1164 BP; 272 A; 289 C; 266 G; 337 T; 0 other;

Query Match 100.0%; Score 1164; DB 21; Length 1164;
Best Local Similarity 100.0%; Pred. No. 0;
Matches 1164; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

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Qy    1 ATGAAGTTCACCGTTGCTATTACTTCAATCGCTGTTGCACTCGCTCTCAGCTCTTCTGCT 60
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Qy   61 GAAGCTGCTTCTTGCAGCTCTGTCTATGGTCAATGTGGTGGCATTGGCTGGACTGGTCCT 120
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Db   61 GAAGCTGCTTCTTGCAGCTCTGTCTATGGTCAATGTGGTGGCATTGGCTGGACTGGTCCT 120

Qy  121 ACATGTTGTGATGCTGGATCGACCTGTAAAGCTCAAAAGGATAACAAATATTATTCTCAA 180
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Db  121 ACATGTTGTGATGCTGGATCGACCTGTAAAGCTCAAAAGGATAACAAATATTATTCTCAA 180

Qy  181 TGTATTCCCAAACCCAAGGGTTCCTCCTCATCATCATCATGTAGTTCCGTCTATAGTCAA 240
          ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db  181 TGTATTCCCAAACCCAAGGGTTCCTCCTCATCATCATCATGTAGTTCCGTCTATAGTCAA 240

Qy  241 TGCGGTGGCATTGGATGGAGTGGACCTACCTGTTGTGAAAGTGGCTCTACTTGCGTTGCT 300
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Db  241 TGCGGTGGCATTGGATGGAGTGGACCTACCTGTTGTGAAAGTGGCTCTACTTGCGTTGCT 300

Qy  301 CAAGAAGGCAACAAATACTACTCTCAATGTCTTCCCGGATCCCACAGTAACAATGCTGGT 360
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Db  301 CAAGAAGGCAACAAATACTACTCTCAATGTCTTCCCGGATCCCACAGTAACAATGCTGGT 360

Qy  361 AACGCTAGCAGCACCAAGAAGACATCTACCAAGACATCTACTACCACCGCCAAGGCTACT 420
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Db  361 AACGCTAGCAGCACCAAGAAGACATCTACCAAGACATCTACTACCACCGCCAAGGCTACT 420

Qy  421 GCTACTGTCACCACCAAGACAGTAACCAAGACAACTACCAAGACAACTACCAAGACTAGC 480
          ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
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Qy  481 ACTACTGCCGCTGCTTCTACTTCCACCTCTTCTTCTGCTGGTTACAAGGTCATCTCTGGC 540
          ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
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Qy  541 GGTAAATCTGGCAGTGGTTCCACAACTCGTTATTGGGATTGTTGTAAAGCTTCTTGCAGC 600
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Db  601 TGGCCTGGAAAAGCTTCTGTCACTGGTCCTGTTGACACCTGTGCCTCCAATGGTATCTCT 660

Qy  661 TTATTAGATGCCAATGCTCAAAGTGGTTGTAACGGTGGTAATGGTTTCATGTGTAACAAC 720
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Db  661 TTATTAGATGCCAATGCTCAAAGTGGTTGTAACGGTGGTAATGGTTTCATGTGTAACAAC 720

Qy  721 AACCAACCTTGGGCTGTCAATGATGAGCTCGCTTACGGTTTCGCTGCTGCCTCTATTGCT 780
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Db  721 AACCAACCTTGGGCTGTCAATGATGAGCTCGCTTACGGTTTCGCTGCTGCCTCTATTGCT 780

Qy  781 GGCTCCAACGAAGCTGGATGGTGTTGTGGCTGTTATGAATTGACCTTCACTTCTGGCGCT 840
          ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db  781 GGCTCCAACGAAGCTGGATGGTGTTGTGGCTGTTATGAATTGACCTTCACTTCTGGCGCT 840

Qy  841 GCTTCTGGAAAGAAGATGGTTGTTCAAGTTACCAACACCGGTGGCGATTTAGGCTCTAAC 900
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Db  841 GCTTCTGGAAAGAAGATGGTTGTTCAAGTTACCAACACCGGTGGCGATTTAGGCTCTAAC 900

Qy  901 CACTTTGATTTGCAAATGCCCGGTGGTGGCGTTGGTATCTTCAATGGCTGTGCTGCTCAA 960
          ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db  901 CACTTTGATTTGCAAATGCCCGGTGGTGGCGTTGGTATCTTCAATGGCTGTGCTGCTCAA 960

Qy  961 TGGGGCGCTCCCAATGATGGCTGGGGAGCTAGATATGGTGGTGTCAGCTCTGTCTCTGAC 1020
          ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db  961 TGGGGCGCTCCCAATGATGGCTGGGGAGCTAGATATGGTGGTGTCAGCTCTGTCTCTGAC 1020

Qy 1021 TGTGCCTCTCTTCCCTCTGCTCTTCAAGCTGGTTGTAAATGGAGATTCAACTGGTTCAAG 1080
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Db 1021 TGTGCCTCTCTTCCCTCTGCTCTTCAAGCTGGTTGTAAATGGAGATTCAACTGGTTCAAG 1080

Qy 1081 AACTCTGATAACCCTACCATGACCTTCAAGGAAGTTACCTGTCCTGCTGAATTAACTACT 1140
          ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db 1081 AACTCTGATAACCCTACCATGACCTTCAAGGAAGTTACCTGTCCTGCTGAATTAACTACT 1140

Qy 1141 CGCTCAGGTTGCGAAAGAAAGTAA 1164
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Db 1141 CGCTCAGGTTGCGAAAGAAAGTAA 1164
```

RESULT 2
AAL43248
ID AAL43248 standard; DNA; 1164 BP.
XX
AC AAL43248;
XX
DT 22-AUG-2002 (first entry)
XX
DE Rhizopus arrhizus endoglucanase-related coding sequence 5.
XX
KW Zygomycetes-originated endoglucanase; cellulose binding domain;
KW fibre processing; waste paper de-inking; paper pulp; ds; gene.
XX
OS Mucor circinelloides.
XX
PN WO200242474-A1.
XX
PD 30-MAY-2002.
XX
PF 21-NOV-2001; 2001WO-JP10188.
XX
PR 21-NOV-2000; 2000JP-0354296.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakane A, Baba Y, Koga J, Kubota H;
XX
DR WPI; 2002-471729/50.
DR P-PSDB; AAO15056.
XX
PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,
PT with effect of endoglucanase activity enhanced in processing fibers,
PT deinking waste paper and improving freeness of paper pulp -
XX
PS Disclosure; Page 75-78; 109pp; Japanese.
XX
CC The invention comprises the amino acid and coding sequences of
CC zygomycetes-originated endoglucanase enzymes lacking the cellulose
CC binding domain. The zygomycetes-originated endoglucanase enzymes of the
CC invention have enhanced endoglucanase activity. The zygomycetes-
CC originated endoglucanase enzymes of the invention are useful for
CC processing fibres, de-inking waste paper and improving the freeness of
CC paper pulp - which is particularly applicable in detergent compositions.

```
CC   The present DNA sequence represents an endoglucanase-related gene
CC   sequence of the invention.
XX
SQ   Sequence 1164 BP; 272 A; 289 C; 266 G; 337 T; 0 other;

  Query Match             100.0%;  Score 1164;  DB 24;  Length 1164;
  Best Local Similarity   100.0%;  Pred. No. 0;
  Matches 1164;  Conservative    0;  Mismatches    0;  Indels    0;  Gaps    0;

Qy          1 ATGAAGTTCACCGTTGCTATTACTTCAATCGCTGTTGCACTCGCTCTCAGCTCTTCTGCT 60
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Db          1 ATGAAGTTCACCGTTGCTATTACTTCAATCGCTGTTGCACTCGCTCTCAGCTCTTCTGCT 60

Qy         61 GAAGCTGCTTCTTGCAGCTCTGTCTATGGTCAATGTGGTGGCATTGGCTGGACTGGTCCT 120
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Qy        121 ACATGTTGTGATGCTGGATCGACCTGTAAAGCTCAAAAGGATAACAAATATTATTCTCAA 180
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Db        121 ACATGTTGTGATGCTGGATCGACCTGTAAAGCTCAAAAGGATAACAAATATTATTCTCAA 180

Qy        181 TGTATTCCCAAACCCAAGGGTTCCTCCTCATCATCATCATGTAGTTCCGTCTATAGTCAA 240
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Db        181 TGTATTCCCAAACCCAAGGGTTCCTCCTCATCATCATCATGTAGTTCCGTCTATAGTCAA 240

Qy        241 TGCGGTGGCATTGGATGGAGTGGACCTACCTGTTGTGAAAGTGGCTCTACTTGCGTTGCT 300
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        241 TGCGGTGGCATTGGATGGAGTGGACCTACCTGTTGTGAAAGTGGCTCTACTTGCGTTGCT 300

Qy        301 CAAGAAGGCAACAAATACTACTCTCAATGTCTTCCCGGATCCCACAGTAACAATGCTGGT 360
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        301 CAAGAAGGCAACAAATACTACTCTCAATGTCTTCCCGGATCCCACAGTAACAATGCTGGT 360

Qy        361 AACGCTAGCAGCACCAAGAAGACATCTACCAAGACATCTACTACCACCGCCAAGGCTACT 420
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        361 AACGCTAGCAGCACCAAGAAGACATCTACCAAGACATCTACTACCACCGCCAAGGCTACT 420

Qy        421 GCTACTGTCACCACCAAGACAGTAACCAAGACAACTACCAAGACAACTACCAAGACTAGC 480
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        421 GCTACTGTCACCACCAAGACAGTAACCAAGACAACTACCAAGACAACTACCAAGACTAGC 480

Qy        481 ACTACTGCCGCTGCTTCTACTTCCACCTCTTCTTCTGCTGGTTACAAGGTCATCTCTGGC 540
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        481 ACTACTGCCGCTGCTTCTACTTCCACCTCTTCTTCTGCTGGTTACAAGGTCATCTCTGGC 540

Qy        541 GGTAAATCTGGCAGTGGTTCCACAACTCGTTATTGGGATTGTTGTAAAGCTTCTTGCAGC 600
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Db        541 GGTAAATCTGGCAGTGGTTCCACAACTCGTTATTGGGATTGTTGTAAAGCTTCTTGCAGC 600

Qy        601 TGGCCTGGAAAAGCTTCTGTCACTGGTCCTGTTGACACCTGTGCCTCCAATGGTATCTCT 660
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        601 TGGCCTGGAAAAGCTTCTGTCACTGGTCCTGTTGACACCTGTGCCTCCAATGGTATCTCT 660

Qy        661 TTATTAGATGCCAATGCTCAAAGTGGTTGTAACGGTGGTAATGGTTTCATGTGTAACAAC 720
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        661 TTATTAGATGCCAATGCTCAAAGTGGTTGTAACGGTGGTAATGGTTTCATGTGTAACAAC 720

Qy        721 AACCAACCTTGGGCTGTCAATGATGAGCTCGCTTACGGTTTCGCTGCTGCCTCTATTGCT 780
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        721 AACCAACCTTGGGCTGTCAATGATGAGCTCGCTTACGGTTTCGCTGCTGCCTCTATTGCT 780

Qy        781 GGCTCCAACGAAGCTGGATGGTGTTGTGGCTGTTATGAATTGACCTTCACTTCTGGCGCT 840
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        781 GGCTCCAACGAAGCTGGATGGTGTTGTGGCTGTTATGAATTGACCTTCACTTCTGGCGCT 840

Qy        841 GCTTCTGGAAAGAAGATGGTTGTTCAAGTTACCAACACCGGTGGCGATTTAGGCTCTAAC 900
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        841 GCTTCTGGAAAGAAGATGGTTGTTCAAGTTACCAACACCGGTGGCGATTTAGGCTCTAAC 900

Qy        901 CACTTTGATTTGCAAATGCCCGGTGGTGGCGTTGGTATCTTCAATGGCTGTGCTGCTCAA 960
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        901 CACTTTGATTTGCAAATGCCCGGTGGTGGCGTTGGTATCTTCAATGGCTGTGCTGCTCAA 960

Qy        961 TGGGGCGCTCCCAATGATGGCTGGGGAGCTAGATATGGTGGTGTCAGCTCTGTCTCTGAC 1020
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        961 TGGGGCGCTCCCAATGATGGCTGGGGAGCTAGATATGGTGGTGTCAGCTCTGTCTCTGAC 1020

Qy       1021 TGTGCCTCTCTTCCCTCTGCTCTTCAAGCTGGTTGTAAATGGAGATTCAACTGGTTCAAG 1080
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1021 TGTGCCTCTCTTCCCTCTGCTCTTCAAGCTGGTTGTAAATGGAGATTCAACTGGTTCAAG 1080

Qy       1081 AACTCTGATAACCCTACCATGACCTTCAAGGAAGTTACCTGTCCTGCTGAATTAACTACT 1140
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Qy       1141 CGCTCAGGTTGCGAAAGAAAGTAA 1164
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Db       1141 CGCTCAGGTTGCGAAAGAAAGTAA 1164


RESULT 3
AAA62729
ID   AAA62729 standard; DNA; 1017 BP.
XX
AC   AAA62729;
XX
DT   25-SEP-2000  (first entry)
XX
DE   Endoglucanase nucleotide sequence 4.
XX
KW   Endoglucanase; cellulcse breakdown; produce pulp; papermaking;
KW   animal foodstuff; ss.
XX
OS   Mucor circinelloides.
XX
PN   WO200024879-A1.
XX
PD   04-MAY-2000.
XX
PF   25-OCT-1999;   99WO-JP05884.
XX
PR   23-OCT-1998;   98JP-0302387.
XX
PA   (MEIJ ) MEIJI SEIKA KAISHA LTD.
XX
PI   Nakamura Y,  Moriya T,  Baba Y,  Yanai K,  Sumida N,  Nishimura T;
PI   Murashima K,  Nakane A,  Yaguchi T,  Koga J,  Murakami T,  Kono T;
XX
DR   WPI; 2000-365117/31.
DR   P-PSDB; AAB09824.
XX
PT   Endoglucanases of fungal origin with high activity under alkaline
PT   conditions for production of paper pulp and animal feedstuffs -
XX
PS   Claim 44; Page 118-119; 180pp; Japanese.
XX
CC   This sequence encodes an endoglucanase protein. The invention relates
CC   to an endoglucanase of fungal origin which can completely break down
CC   purified cellulose at a concentration of less than 1mg protein/litre,
CC   and produces more than 50% breakdown of cellulose at pH 8.5. The
CC   invention includes endoglucanase protein sequences (see
CC   AAB09825-B09830), endoglucanase nucleotide sequences (see
CC   AAA62726-A62732) and primers (AAA62733-A62802) which are used in the
CC   identification of the endoglucanase sequences, and in the construction of
CC   vectors containing the polynucleotides. The endoglucanase enzymes are
CC   used for the production of pulp for papermaking and for the production of
CC   animal foodstuffs.
XX
SQ   Sequence 1017 BP; 233 A; 255 C; 236 G; 293 T; 0 other;

  Query Match             80.8%;  Score 940;  DB 21;  Length 1017;
  Best Local Similarity   98.4%;  Pred. No. 7.4e-268;
  Matches  949;  Conservative    0;  Mismatches   15;  Indels    0;  Gaps    0;

Qy        201 TTCCTCCTCATCATCATCATGTAGTTCCGTCTATAGTCAATGCGGTGGCATTGGATGGAG 260
              ||| |   | | | || || || || |||||| ||||||| ||||||||||||||||||
```

```
Db        54 TTCTGCTGAAGCTGCTTCTTGCAGCTCTGTCTATGGTCAATGTGGTGGCATTGGATGGAG 113

Qy       261 TGGACCTACCTGTTGTGAAAGTGGCTCTACTTGCGTTGCTCAAGAAGGCAACAAATACTA 320
            |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       114 TGGACCTACCTGTTGTGAAAGTGGCTCTACTTGCGTTGCTCAAGAAGGCAACAAATACTA 173

Qy       321 CTCTCAATGTCTTCCCGGATCCCACAGTAACAATGCTGGTAACGCTAGCAGCACCAAGAA 380
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       174 CTCTCAATGTCTTCCCGGATCCCACAGTAACAATGCTGGTAACGCTAGCAGCACCAAGAA 233

Qy       381 GACATCTACCAAGACATCTACTACCACCGCCAAGGCTACTGCTACTGTCACCACCAAGAC 440
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       234 GACATCTACCAAGACATCTACTACCACCGCCAAGGCTACTGCTACTGTCACCACCAAGAC 293

Qy       441 AGTAACCAAGACAACTACCAAGACAACTACCAAGACTAGCACTACTGCCGCTGCTTCTAC 500
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       294 AGTAACCAAGACAACTACCAAGACAACTACCAAGACTAGCACTACTGCCGCTGCTTCTAC 353

Qy       501 TTCCACCTCTTCTTCTGCTGGTTACAAGGTCATCTCTGGCGGTAAATCTGGCAGTGGTTC 560
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       354 TTCCACCTCTTCTTCTGCTGGTTACAAGGTCATCTCTGGCGGTAAATCTGGCAGTGGTTC 413

Qy       561 CACAACTCGTTATTGGGATTGTTGTAAAGCTTCTTGCAGCTGGCCTGGAAAAGCTTCTGT 620
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       414 CACAACTCGTTATTGGGATTGTTGTAAAGCTTCTTGCAGCTGGCCTGGAAAAGCTTCTGT 473

Qy       621 CACTGGTCCTGTTGACACCTGTGCCTCCAATGGTATCTCTTTATTAGATGCCAATGCTCA 680
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       474 CACTGGTCCTGTTGACACCTGTGCCTCCAATGGTATCTCTTTATTAGATGCCAATGCTCA 533

Qy       681 AAGTGGTTGTAACGGTGGTAATGGTTTCATGTGTAACAACAACCAACCTTGGGCTGTCAA 740
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       534 AAGTGGTTGTAACGGTGGTAATGGTTTCATGTGTAACAACAACCAACCTTGGGCTGTCAA 593

Qy       741 TGATGAGCTCGCTTACGGTTTCGCTGCTGCCTCTATTGCTGGCTCCAACGAAGCTGGATG 800
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       594 TGATGAGCTCGCTTACGGTTTCGCTGCTGCCTCTATTGCTGGCTCCAACGAAGCTGGATG 653

Qy       801 GTGTTGTGGCTGTTATGAATTGACCTTCACTTCTGGCGCTGCTTCTGGAAAGAAGATGGT 860
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       654 GTGTTGTGGCTGTTATGAATTGACCTTCACTTCTGGCGCTGCTTCTGGAAAGAAGATGGT 713

Qy       861 TGTTCAAGTTACCAACACCGGTGGCGATTTAGGCTCTAACCACTTTGATTTGCAAATGCC 920
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       714 TGTTCAAGTTACCAACACCGGTGGCGATTTAGGCTCTAACCACTTTGATTTGCAAATGCC 773

Qy       921 CGGTGGTGGCGTTGGTATCTTCAATGGCTGTGCTGCTCAATGGGGCGCTCCCAATGATGG 980
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       774 CGGTGGTGGCGTTGGTATCTTCAATGGCTGTGCTGCTCAATGGGGCGCTCCCAATGATGG 833

Qy       981 CTGGGGAGCTAGATATGGTGGTGTCAGCTCTGTCTCTGACTGTGCCTCTCTTCCCTCTGC 1040
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       834 CTGGGGAGCTAGATATGGTGGTGTCAGCTCTGTCTCTGACTGTGCCTCTCTTCCCTCTGC 893

Qy      1041 TCTTCAAGCTGGTTGTAAATGGAGATTCAACTGGTTCAAGAACTCTGATAACCCTACCAT 1100
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       894 TCTTCAAGCTGGTTGTAAATGGAGATTCAACTGGTTCAAGAACTCTGATAACCCTACCAT 953

Db       954 GACCTTCAAGGAAGTTACCTGTCCTGCTGAATTAACTACTCGCTCAGGTTGCGAAAGAAA 1013

Qy      1101 GACCTTCAAGGAAGTTACCTGTCCTGCTGAATTAACTACTCGCTCAGGTTGCGAAAGAAA 1160
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||

Qy      1161 GTAA 1164
            ||||
Db      1014 GTAA 1017
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RESULT 4
AAL43247
ID AAL43247 standard; DNA; 1017 BP.
XX
AC AAL43247;
XX
DT 22-AUG-2002 (first entry)
XX
DE Rhizopus arrhizus endoglucanase-related coding sequence 4.
XX
KW Zygomycetes-originated endoglucanase; cellulose binding domain;
KW fibre processing; waste paper de-inking; paper pulp; ds; gene.
XX
OS Mucor circinelloides.
XX
PN WO200242474-A1.
XX
PD 30-MAY-2002.
XX
PF 21-NOV-2001; 2001WO-JP10188.
XX
PR 21-NOV-2000; 2000JP-0354296.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakane A, Baba Y, Koga J, Kubota H;
XX
DR WPI; 2002-471729/50.
DR P-PSDB; AAO15055.
XX
PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,
PT with effect of endoglucanase activity enhanced in processing fibers,
PT deinking waste paper and improving freeness of paper pulp -
XX
PS Disclosure; Page 70-73; 109pp; Japanese.
XX
CC The invention comprises the amino acid and coding sequences of
CC zygomycetes-originated endoglucanase enzymes lacking the cellulose
CC binding domain. The zygomycetes-originated endoglucanase enzymes of the
CC invention have enhanced endoglucanase activity. The zygomycetes-
CC originated endoglucanase enzymes of the invention are useful for
CC processing fibres, de-inking waste paper and improving the freeness of
CC paper pulp - which is particularly applicable in detergent compositions.
CC The present DNA sequence represents an endoglucanase-related gene
CC sequence of the invention.
XX
SQ Sequence 1017 BP; 233 A; 255 C; 236 G; 293 T; 0 other;

Query Match 80.8%; Score 940; DB 24; Length 1017;
Best Local Similarity 98.4%; Pred. No. 7.4e-268;
Matches 949; Conservative 0; Mismatches 15; Indels 0; Gaps 0;

```
Qy       201 TTCCTCCTCATCATCATCATGTAGTTCCGTCTATAGTCAATGCGGTGGCATTGGATGGAG 260
            ||| |  | |  | || || || || |||||| |||||| ||||||||||||||||||||
Db        54 TTCTGCTGAAGCTGCTTCTTGCAGCTCTGTCTATGGTCAATGTGGTGGCATTGGATGGAG 113

Qy       261 TGGACCTACCTGTTGTGAAAGTGGCTCTACTTGCGTTGCTCAAGAAGGCAACAAATACTA 320
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       114 TGGACCTACCTGTTGTGAAAGTGGCTCTACTTGCGTTGCTCAAGAAGGCAACAAATACTA 173

Qy       321 CTCTCAATGTCTTCCCGGATCCCACAGTAACAATGCTGGTAACGCTAGCAGCACCAAGAA 380
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       174 CTCTCAATGTCTTCCCGGATCCCACAGTAACAATGCTGGTAACGCTAGCAGCACCAAGAA 233

Qy       381 GACATCTACCAAGACATCTACTACCACCGCCAAGGCTACTGCTACTGTCACCACCAAGAC 440
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       234 GACATCTACCAAGACATCTACTACCACCGCCAAGGCTACTGCTACTGTCACCACCAAGAC 293

Qy       441 AGTAACCAAGACAACTACCAAGACAACTACCAAGACTAGCACTACTGCCGCTGCTTCTAC 500
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       294 AGTAACCAAGACAACTACCAAGACAACTACCAAGACTAGCACTACTGCCGCTGCTTCTAC 353

Qy       501 TTCCACCTCTTCTTCTGCTGGTTACAAGGTCATCTCTGGCGGTAAATCTGGCAGTGGTTC 560
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       354 TTCCACCTCTTCTTCTGCTGGTTACAAGGTCATCTCTGGCGGTAAATCTGGCAGTGGTTC 413

Qy       561 CACAACTCGTTATTGGGATTGTTGTAAAGCTTCTTGCAGCTGGCCTGGAAAAGCTTCTGT 620
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       414 CACAACTCGTTATTGGGATTGTTGTAAAGCTTCTTGCAGCTGGCCTGGAAAAGCTTCTGT 473
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Qy        621 CACTGGTCCTGTTGACACCTGTGCCTCCAATGGTATCTCTTTATTAGATGCCAATGCTCA 680
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        474 CACTGGTCCTGTTGACACCTGTGCCTCCAATGGTATCTCTTTATTAGATGCCAATGCTCA 533

Qy        681 AAGTGGTTGTAACGGTGGTAATGGTTTCATGTGTAACAACAACCAACCTTGGGCTGTCAA 740
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        534 AAGTGGTTGTAACGGTGGTAATGGTTTCATGTGTAACAACAACCAACCTTGGGCTGTCAA 593

Qy        741 TGATGAGCTCGCTTACGGTTTCGCTGCTGCCTCTATTGCTGGCTCCAACGAAGCTGGATG 800
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        594 TGATGAGCTCGCTTACGGTTTCGCTGCTGCCTCTATTGCTGGCTCCAACGAAGCTGGATG 653

Qy        801 GTGTTGTGGCTGTTATGAATTGACCTTCACTTCTGGCGCTGCTTCTGGAAAGAAGATGGT 860
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        654 GTGTTGTGGCTGTTATGAATTGACCTTCACTTCTGGCGCTGCTTCTGGAAAGAAGATGGT 713

Qy        861 TGTTCAAGTTACCAACACCGGTGGCGATTTAGGCTCTAACCACTTTGATTTGCAAATGCC 920
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        714 TGTTCAAGTTACCAACACCGGTGGCGATTTAGGCTCTAACCACTTTGATTTGCAAATGCC 773

Qy        921 CGGTGGTGGCGTTGGTATCTTCAATGGCTGTGCTGCTCAATGGGGCGCTCCCAATGATGG 980
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        774 CGGTGGTGGCGTTGGTATCTTCAATGGCTGTGCTGCTCAATGGGGCGCTCCCAATGATGG 833

Qy        981 CTGGGGAGCTAGATATGGTGGTGTCAGCTCTGTCTCTGACTGTGCCTCTCTTCCCTCTGC 1040
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        834 CTGGGGAGCTAGATATGGTGGTGTCAGCTCTGTCTCTGACTGTGCCTCTCTTCCCTCTGC 893

Qy       1041 TCTTCAAGCTGGTTGTAAATGGAGATTCAACTGGTTCAAGAACTCTGATAACCCTACCAT 1100
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        894 TCTTCAAGCTGGTTGTAAATGGAGATTCAACTGGTTCAAGAACTCTGATAACCCTACCAT 953

Qy       1101 GACCTTCAAGGAAGTTACCTGTCCTGCTGAATTAACTACTCGCTCAGGTTGCGAAAGAAA 1160
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        954 GACCTTCAAGGAAGTTACCTGTCCTGCTGAATTAACTACTCGCTCAGGTTGCGAAAGAAA 1013

Qy       1161 GTAA 1164
              ||||
Db       1014 GTAA 1017
```

RESULT 5
AAA62726
ID AAA62726 standard; DNA; 1017 BP.
XX
AC AAA62726;
XX
DT 25-SEP-2000 (first entry)
XX
DE Endoglucanase nucleotide sequence 1.
XX
KW Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KW animal foodstuff; ss.
XX
OS Rhizopus oryzae.
XX
PN WO200024879-A1.
XX
PD 04-MAY-2000.
XX
PF 25-OCT-1999; 99WO-JP05884.
XX
PR 23-OCT-1998; 98JP-0302387.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;
PI Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;
XX
DR WPI; 2000-365117/31.
DR P-PSDB; AAB09821.
XX
PT Endoglucanases of fungal origin with high activity under alkaline
PT conditions for production of paper pulp and animal feedstuffs -
XX
PS Claim 44; Page 104-105; 180pp; Japanese.
XX
CC This sequence encodes an endoglucanase protein. The invention relates
CC to an endoglucanase of fungal origin which can completely break down
CC purified cellulose at a concentration of less than 1mg protein/litre,
CC and produces more than 50% breakdown of cellulose at pH 8.5. The
CC invention includes endoglucanase protein sequences (see
CC AAB09825-B09830), endoglucanase nucleotide sequences (see
CC AAA62726-A62732) and primers (AAA62733-A62802) which are used in the
CC identification of the endoglucanase sequences, and in the construction of
CC vectors containing the polynucleotides. The endoglucanase enzymes are
CC used for the production of pulp for papermaking and for the production of
CC animal foodstuffs.
XX
SQ Sequence 1017 BP; 240 A; 250 C; 235 G; 292 T; 0 other;

Query Match 35.5%; Score 413; DB 21; Length 1017;
Best Local Similarity 67.4%; Pred. No. 1e-111;
Matches 654; Conservative 0; Mismatches 290; Indels 27; Gaps 4;

```
Qy        206 CCTCATCATCATCATGTAGTTCCGTCTATAGTCAATGCGGTGGCATTGGATGGAGTGGAC 265
              ||||  |  |  ||||||     | ||| |||||| |||||  |     |||| ||| |
Db         62 CCTCTGCTGCTGAATGTAGCAAATTGTATGGTCAATGTGGTGGTAAGAACTGGAATGGCC 121

Qy        266 CTACCTGTTGTGAAAGTGGCTCTACTTGCGTTGCTCAAGAAGGCAACAAATACTACTCTC 325
              ||||  |||||||||  ||| || || ||       | ||| | ||||| | ||||||||||
Db        122 CTACTTGTTGTGAATCTGGATCCACCTG------TAAAGTAAGCAACGATTACTACTCTC 175

Qy        326 AATGTCTTCCCGGATCCCACAGTAACAATGCTGGTAACGCTAGCAGCACCAAGAAGACAT 385
              ||||||||||         ||||  ||||      |   |  ||      |||||||||
Db        176 AATGTCTTCCCTCTGGAAGCAGTGGCAATAAATCTTCTGAAAGTGCTCACAAGAAGAC-- 233

Qy        386 CTACCAAGACATCTACTACCACCGCCAAGGCTACTGCTACTGTCACCACCAAGACAGTAA 445
                  ||  || ||  |   |   ||| ||||| |  |||      |  |||||    |
Db        234 -------TACCACTGCTGCTCACAAGAAGACTACTACCGCTGCTCATAAAAAGACTACCA 286

Qy        446 CCAAGACAACTACCAAGACAACTACCAAGACTAGCACTACTGCCGCTGCTTCTACTTCCA 505
              |    |  |||  ||||| || ||     | |   || |  || || ||      || |
Db        287 CTGCTCCTGCTAAGAAGACTACAACTGTTGCCAAAGCTTCCACCCCTTCTAACTCTAGCT 346

Qy        506 CCTCTTCTTCTGCTGGTTACAAGGTCATCTCTGGCGGTAAATCTGGCAGTGGTTCCACAA 565
              |    ||    |   ||    |  ||||||| |||   ||||| |  |||  ||| |
Db        347 CTAGCTCCAGCGGCAAATATTCCGCTGTCTCTGGTGGTGCCTCTGGTAACGGTGTCACTA 406

Qy        566 CTCGTTATTGGGATTGTTGTAAAGCTTCTTGCAGCTGGCCTGGAAAAGCTTCTGTCACTG 625
              ||||||||||||||| ||||| || || || |||||||| || || ||   ||||| |
Db        407 CTCGTTATTGGGATTGCTGTAAGGCCTCCTGTAGCTGGCCCGGTAAGGCCAATGTCAGTT 466

Qy        626 GTCCTGTTGACACCTGTGCCTCCAATGGTATCTCT---TTATTAGATGCCAATGCTCAAA 682
              ||||||  |  ||||| |    ||||| || ||    |    ||  |||||| ||||
Db        467 CTCCTGTCAAGTCCTGTAACAAAGATGGTGTCACTGCCCTTAGTGACAGCAATGCCCAAA 526

Qy        683 GTGGTTGTAACGGTGGTAATGGTTTCATGTGTAACAACAACCAACCTTGGGCTGTCAATG 742
              |||| ||||||||||||||  ||| |||||||||| ||||||||||||||||||| || |
Db        527 GTGGCTGTAACGGTGGTAACAGTTACATGTGTAACGACAACCAACCTTGGGCTGTAAACG 586

Qy        743 ATGAGCTCGCTTACGGTTTCGCTGCTGCCTCTATTGCTGGCTCCAACGAAGCTGGATGGT 802
              |  | || || || ||||||||||||||  | ||   |||      ||| || | ||||
Db        587 ACAACCTTGCCTATGGTTTCGCTGCTGCTGCCATCAGTGGTGGTGGTGAATCTCGCTGGT 646

Qy        803 GTTGTGGCTGTTATGAATTGACCTTCACTTCTGGCGCTGCTTCTGGAAAGAAGATGGTTG 862
              | ||| ||||  ||| | || |||||||||  | ||| | |||| ||||||||||||||
Db        647 GCTGTTCTTGTTTCGAACTTACTTTCACTTCTACCTCTGTTGCTGGTAAGAAGATGGTTG 706

Qy        863 TTCAAGTTACCAACACCGGTGGCGATTTAGGCTC---------TAACCACTTTGATTTGC 913
              | ||||| || ||||| ||||| ||| | |||||         |   |||||||| ||||
Db        707 TCCAAGTCACTAACACTGGTGGTGATCTTGGCTCCTCTACTGGTGCTCACTTTGACTTGC 766

Qy        914 AAATGCCCGGTGGTGGCGTTGGTATCTTCAATGGCTGTGCTGCTCAATGGGGCGCTCCCA 973
              |||||||||||||||| |||||||| |||||||| ||| |    |||||||| |||||||
```

```
Db        767 AAATGCCCGGTGGTGGTGTTGGTATTTTCAATGGTTGTTCCAGCCAATGGGGTGCTCCCA 826

Qy        974 ATGATGGCTGGGGAGCTAGATATGGTGGTGTCAGCTCTGTCTCTGACTGTGCCTCTCTTC 1033
              |||| || |||||  | ||||| ||||||  |    ||||  ||||||||  |   |||||
Db        827 ATGACGGTTGGGGCTCAAGATACGGTGGTATTTCTTCTGCATCTGACTGCTCTAGTCTTC 886

Qy       1034 CCTCTGCTCTTCAAGCTGGTTGTAAATGGAGATTCAACTGGTTCAAGAACTCTGATAACC 1093
              | || || || ||||||||||||||||||||||||||||||||||||||||| |||||||||
Db        887 CTTCCGCACTCCAAGCTGGTTGTAAATGGAGATTCAACTGGTTCAAGAACGCTGATAACC 946

Qy       1094 CTACCATGACCTTCAAGGAAGTTACCTGTCCTGCTGAATTAACTACTCGCTCAGGTTGCG 1153
              | | |||||| | ||||||||||||||||||||    ||| | ||  |      |||||||
Db        947 CAAGCATGACTTACAAGGAAGTTACCTGTCCTAAGGAAATCACCGCCAAGACAGGTTGTT 1006

Qy       1154 AAAGAAAGTAA 1164
              ||||||| |||
Db       1007 CAAGAAAATAA 1017
```

RESULT 6
AAL43244
ID AAL43244 standard; DNA; 1017 BP.
XX
AC AAL43244;
XX
DT 22-AUG-2002 (first entry)
XX
DE Rhizopus arrhizus endoglucanase-related coding sequence 1.
XX
KW Zygomycetes-originated endoglucanase; cellulose binding domain;
KW fibre processing; waste paper de-inking; paper pulp; ds; gene.
XX
OS Rhizopus arrhizus.
XX
PN WO200242474-A1.
XX
PD 30-MAY-2002.
XX
PF 21-NOV-2001; 2001WO-JP10188.
XX
PR 21-NOV-2000; 2000JP-0354296.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakane A, Baba Y, Koga J, Kubota H;
XX
DR WPI; 2002-471729/50.
DR P-PSDB; AAO15052.
XX
PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,
PT with effect of endoglucanase activity enhanced in processing fibers,
PT deinking waste paper and improving freeness of paper pulp -
XX
PS Example 10; Page 56-58; 109pp; Japanese.
XX
CC The invention comprises the amino acid and coding sequences of
CC zygomycetes-originated endoglucanase enzymes lacking the cellulose
CC binding domain. The zygomycetes-originated endoglucanase enzymes of the
CC invention have enhanced endoglucanase activity. The zygomycetes-
CC originated endoglucanase enzymes of the invention are useful for
CC processing fibres, de-inking waste paper and improving the freeness of
CC paper pulp - which is particularly applicable in detergent compositions.
CC The present DNA sequence represents an endoglucanase-related gene
CC sequence of the invention.
XX
SQ Sequence 1017 BP; 240 A; 250 C; 235 G; 292 T; 0 other;

Query Match 35.5%; Score 413; DB 24; Length 1017;
Best Local Similarity 67.4%; Pred. No. 1e-111;
Matches 654; Conservative 0; Mismatches 290; Indels 27; Gaps 4;

```
Qy        206 CCTCATCATCATCATGTAGTTCCGTCTATAGTCAATGCGGTGGCATTGGATGGAGTGGAC 265
              ||||  |  |  ||||||     | ||| ||||||| ||||| |     |||| ||| |

Db         62 CCTCTGCTGCTGAATGTAGCAAATTGTATGGTCAATGTGGTGGTAAGAACTGGAATGGCC 121

Qy        266 CTACCTGTTGTGAAAGTGGCTCTACTTGCGTTGCTCAAGAAGGCAACAAATACTACTCTC 325
              |||| |||||||||  ||| || || ||       | ||| | ||||| | ||||||||||
Db        122 CTACTTGTTGTGAATCTGGATCCACCTG------TAAAGTAAGCAACGATTACTACTCTC 175

Qy        326 AATGTCTTCCCGGATCCCACAGTAACAATGCTGGTAACGCTAGCAGCACCAAGAAGACAT 385
              ||||||||||          ||||  ||||     |    |  ||        |||||||||
Db        176 AATGTCTTCCCTCTGGAAGCAGTGGCAATAAATCTTCTGAAAGTGCTCACAAGAAGAC-- 233

Qy        386 CTACCAAGACATCTACTACCACCGCCAAGGCTACTGCTACTGTCACCACCAAGACAGTAA 445
                      ||  || || |   |   ||| ||||| |  |||     |  |||||   |
Db        234 -------TACCACTGCTGCTCACAAGAAGACTACTACCGCTGCTCATAAAAAGACTACCA 286

Qy        446 CCAAGACAACTACCAAGACAACTACCAAGACTAGCACTACTGCCGCTGCTTCTACTTCCA 505
              |     |  |||  ||||| || ||     | |   || |  || || ||    ||  |
Db        287 CTGCTCCTGCTAAGAAGACTACAACTGTTGCCAAAGCTTCCACCCCTTCTAACTCTAGCT 346

Qy        506 CCTCTTCTTCTGCTGGTTACAAGGTCATCTCTGGCGGTAAATCTGGCAGTGGTTCCACAA 565
              |   ||   |   ||    |   |||||| |||   ||||| |  |||  ||| |
Db        347 CTAGCTCCAGCGGCAAATATTCCGCTGTCTCTGGTGGTGCCTCTGGTAACGGTGTCACTA 406

Qy        566 CTCGTTATTGGGATTGTTGTAAAGCTTCTTGCAGCTGGCCTGGAAAAGCTTCTGTCACTG 625
              |||||||||||||||| ||||| || || |||||||| || || ||   ||||| |
Db        407 CTCGTTATTGGGATTGCTGTAAGGCCTCCTGTAGCTGGCCCGGTAAGGCCAATGTCAGTT 466

Qy        626 GTCCTGTTGACACCTGTGCCTCCAATGGTATCTCT---TTATTAGATGCCAATGCTCAAA 682
              ||||||  |  |||||  |    ||||| || ||    |   ||  |||||| ||||
Db        467 CTCCTGTCAAGTCCTGTAACAAAGATGGTGTCACTGCCCTTAGTGACAGCAATGCCCAAA 526

Qy        683 GTGGTTGTAACGGTGGTAATGGTTTCATGTGTAACAACAACCAACCTTGGGCTGTCAATG 742
              |||| |||||||||||||  ||| |||||||||| ||||||||||||||||||| || |
Db        527 GTGGCTGTAACGGTGGTAACAGTTACATGTGTAACGACAACCAACCTTGGGCTGTAAACG 586

Qy        743 ATGAGCTCGCTTACGGTTTCGCTGCTGCCTCTATTGCTGGCTCCAACGAAGCTGGATGGT 802
              |  | || || || ||||||||||||||  | ||   |||       ||| || | ||||
Db        587 ACAACCTTGCCTATGGTTTCGCTGCTGCTGCCATCAGTGGTGGTGGTGAATCTCGCTGGT 646

Qy        803 GTTGTGGCTGTTATGAATTGACCTTCACTTCTGGCGCTGCTTCTGGAAAGAAGATGGTTG 862
              | |||   ||||  ||| | || |||||||||  | ||| | |||| ||||||||||||||
Db        647 GCTGTTCTTGTTTCGAACTTACTTTCACTTCTACCTCTGTTGCTGGTAAGAAGATGGTTG 706

Qy        863 TTCAAGTTACCAACACCGGTGGCGATTTAGGCTC---------TAACCACTTTGATTTGC 913
              | ||||| || ||||| ||||| ||| | |||||         |  ||||||| ||||
Db        707 TCCAAGTCACTAACACTGGTGGTGATCTTGGCTCCTCTACTGGTGCTCACTTTGACTTGC 766

Qy        914 AAATGCCCGGTGGTGGCGTTGGTATCTTCAATGGCTGTGCTGCTCAATGGGGCGCTCCCA 973
              |||||||||||||||| |||||||| |||||||| ||| |     |||||||| |||||||
Db        767 AAATGCCCGGTGGTGGTGTTGGTATTTTCAATGGTTGTTCCAGCCAATGGGGTGCTCCCA 826

Qy        974 ATGATGGCTGGGGAGCTAGATATGGTGGTGTCAGCTCTGTCTCTGACTGTGCCTCTCTTC 1033
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Db        827 ATGACGGTTGGGGCTCAAGATACGGTGGTATTTCTTCTGCATCTGACTGCTCTAGTCTTC 886

Qy       1034 CCTCTGCTCTTCAAGCTGGTTGTAAATGGAGATTCAACTGGTTCAAGAACTCTGATAACC 1093
              | || || || ||||||||||||||||||||||||||||||||||||||||| |||||||||
Db        887 CTTCCGCACTCCAAGCTGGTTGTAAATGGAGATTCAACTGGTTCAAGAACGCTGATAACC 946

Qy       1094 CTACCATGACCTTCAAGGAAGTTACCTGTCCTGCTGAATTAACTACTCGCTCAGGTTGCG 1153
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Db        947 CAAGCATGACTTACAAGGAAGTTACCTGTCCTAAGGAAATCACCGCCAAGACAGGTTGTT 1006

Qy       1154 AAAGAAAGTAA 1164
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Db       1007 CAAGAAAATAA 1017
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RESULT 7
AAA62728
ID AAA62728 standard; DNA; 1083 BP.
XX
AC AAA62728;
XX

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DT   25-SEP-2000  (first entry)
XX
DE   Endoglucanase nucleotide sequence 3.
XX
KW   Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KW   animal foodstuff; ss.
XX
OS   Rhizopus oryzae.
XX
PN   WO200024879-A1.
XX
PD   04-MAY-2000.
XX
PF   25-OCT-1999;   99WO-JP05884.
XX
PR   23-OCT-1998;   98JP-0302387.
XX
PA   (MEIJ ) MEIJI SEIKA KAISHA LTD.
XX
PI   Nakamura Y,  Moriya T,  Baba Y,  Yanai K,  Sumida N,  Nishimura T;
PI   Murashima K,  Nakane A,  Yaguchi T,  Koga J,  Murakami T,  Kono T;
XX
DR   WPI; 2000-365117/31.
DR   P-PSDB; AAB09823.
XX
PT   Endoglucanases of fungal origin with high activity under alkaline
PT   conditions for production of paper pulp and animal feedstuffs  -
XX
PS   Claim 44; Page 113-115; 180pp; Japanese.
XX
CC   This sequence encodes an endoglucanase protein. The invention relates
CC   to an endoglucanase of fungal origin which can completely break down
CC   purified cellulose at a concentration of less than 1mg protein/litre,
CC   and produces more than 50% breakdown of cellulose at pH 8.5. The
CC   invention includes endoglucanase protein sequences (see
CC   AAB09825-B09830), endoglucanase nucleotide sequences (see
CC   AAA62726-A62732) and primers (AAA62733-A62802) which are used in the
CC   identification of the endoglucanase sequences, and in the construction of
CC   vectors containing the polynucleotides. The endoglucanase enzymes are
CC   used for the production of pulp for papermaking and for the production of
CC   animal foodstuffs.
XX
SQ   Sequence 1083 BP; 260 A; 297 C; 231 G; 295 T; 0 other;
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Query Match 34.2%; Score 398.6; DB 21; Length 1083;
Best Local Similarity 65.6%; Pred. No. 1.9e-107;
Matches 662; Conservative 0; Mismatches 284; Indels 63; Gaps 3;

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Qy        219 ATGTAGTTCCGTCTATAGTCAATGCGGTGGCATTGGATGGAGTGGACCTACCTGTTGTGA 278
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Qy        279 AAGTGGCTCTACTTGCGTTGCTCAAGAAGGCAACAAATACTACTCTCAATGTCTTCC--- 335
Db        135 ATCTGGCTCTACTTGCGTTGATTATCCTGACAATCCTTTCTACTCCCAATGTGTTCCCAA 194

Qy        336 ------CGGATCCCACAGTAACAATGCTGGTAACGCTAGCAGCACCAAGAAGACATCTAC 389
Db        195 TGAAAACCTCACCTCCACTAACAAATCTTCTCACAAAACCACCACTACTGAGAGTGCCAA 254

Qy        390 CAAGACATCTACT----------------------------------------------AC 404
Db        255 GAAGACTACCACTACTAAAGGTTCCAAGAAGACCACCACTACTGAAGCCTCTAAGAAGAC 314

Qy        405 CACCGCCAAGGCTACTGCTACTGTCACCACCAAGACAGTAACCAAGACAACTACCAAGAC 464
Db        315 CACCACTACTGAAGCTTCCAAGAAGACCACCACTACTGAAGCCTCTAAGAAGACCACCAC 374

Qy        465 AACTACCAAGACTAGCACTACTGCCGCTGCTTCTACTTCCACCTCTTCTTCTGCTGGTTA 524
Db        375 TACTACTAAGAAGGCTTCTACCTCCACTTCCTCTTCCTCTTCTTCTGCTTCTACAAACTA 434

Qy        525 CAAGGTCATCTCTGGCGGTAAATCTGGCAGTGGTTCCACAACTCGTTATTGGGATTGTTG 584
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Qy        585 TAAAGCTTCTTGCAGCTGGCCTGGAAAAGCTTCTGTCACTGGTCCTGTTGACACCTGTGC 644
Db        495 TAAGCCTTCTTGCAGTTGGCCCGGTAAGGCTGATGTCACCTCCCCTGTTGGCTCCTGTAA 554

Qy        645 CTCCAATGGTATCTCTTTATTAGATGCCAATGCTCAAAGTGGTTGTAACGGTGGTAATGG 704
Db        555 CAAGGATGGTAAGACTCTTGCTGATAACAACACTCAAAACGGCTGTGTTGGTGGTAGCAG 614

Qy        705 TTTCATGTGTAACAACAACCAACCTTGGGCTGTCAATGATGAGCTCGCTTACGGTTTCGC 764
Db        615 CTACACCTGTAATGACAATCAACCTTGGGTTGTTAGCGACGACCTTGCCTACGGTTTCGC 674

Qy        765 TGCTGCCTCTATTGCTGGCTCCAACGAAGCTGGATGGTGTTGTGGCTGTTATGAATTGAC 824
Db        675 CGCTGCTTCCATTTCTGGTGGTAGCGAAGCTACTTGGTGTTGTGCCTGTTTCGAACTCAC 734

Qy        825 CTTCACTTCTGGCGCTGCTTCTGGAAAGAAGATGGTTGTTCAAGTTACCAACACCGGTGG 884
Db        735 ATTCACCTCTACTGCCGTCAAGGGTAAGAAGATGGTTGTTCAAGTAACCAACACTGGTTC 794

Qy        885 CGATTTAGGCTCTAAC---------CACTTTGATTTGCAAATGCCCGGTGGTGGCGTTGG 935
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Qy        936 TATCTTCAATGGCTGTGCTGCTCAATGGGGCGCTCCCAATGATGGCTGGGGAGCTAGATA 995
Db        855 TATCTACAATGGTTGTGCCACTCAATGGGGTGCTCCCACCGATGGTTGGGGTGCAAGATA 914

Qy        996 TGGTGGTGTCAGCTCTGTCTCTGACTGTGCCTCTCTTCCCTCTGCTCTTCAAGCTGGTTG 1055
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Qy       1056 TAAATGGAGATTCAACTGGTTCAAGAACTCTGATAACCCTACCATGACCTTCAAGGAAGT 1115
Db        975 TAAGTGGAGATTCGGCTGGTTCAAAAACGCTGATAACCCAACCATGACCTACAAACAAGT 1034

Qy       1116 TACCTGTCCTGCTGAATTAACTACTCGCTCAGGTTGCGAAAGAAAGTAA 1164
Db       1035 TACCTGTCCCAAGGCTATCACTGCCAAGTCTGGCTGTTCAAGAAAATAA 1083
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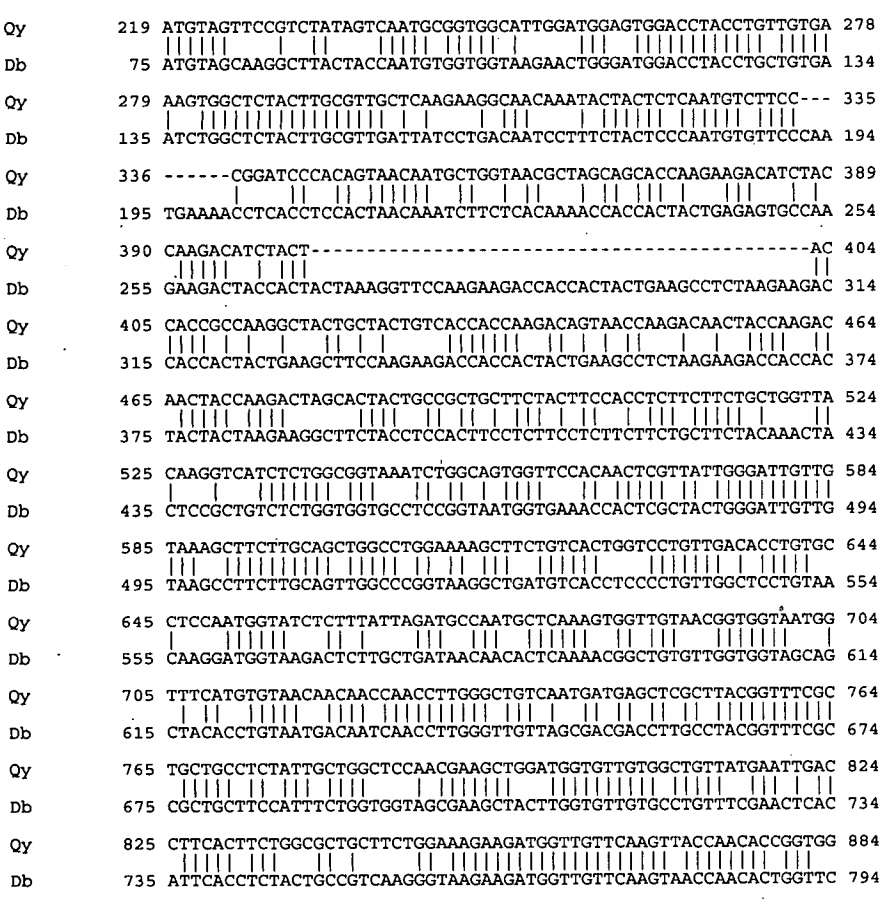
RESULT 8
AAL43246
ID   AAL43246 standard; DNA; 1083 BP.
XX
AC   AAL43246;
XX
DT   22-AUG-2002  (first entry)
XX
DE   Rhizopus arrhizus endoglucanase-related coding sequence 3.
XX
KW   Zygomycetes-originated endoglucanase; cellulose binding domain;
KW   fibre processing; waste paper de-inking; paper pulp; ds; gene.
XX
OS   Rhizopus arrhizus.
XX
PN   WO200242474-A1.
XX
PD   30-MAY-2002.
XX
PF   21-NOV-2001; 2001WO-JP10188.
XX
PR   21-NOV-2000; 2000JP-0354296.
XX
PA   (MEIJ ) MEIJI SEIKA KAISHA LTD.
XX
PI   Nakane A,  Baba Y,  Koga J,  Kubota H;
XX
DR   WPI; 2002-471729/50.
DR   P-PSDB; AAO15054.
```

XX
PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,
PT with effect of endoglucanase activity enhanced in processing fibers,
PT deinking waste paper and improving freeness of paper pulp -
XX
PS Disclosure; Page 65-68; 109pp; Japanese.
XX
CC The invention comprises the amino acid and coding sequences of
CC zygomycetes-originated endoglucanase enzymes lacking the cellulose
CC binding domain. The zygomycetes-originated endoglucanase enzymes of the
CC invention have enhanced endoglucanase activity. The zygomycetes-
CC originated endoglucanase enzymes of the invention are useful for
CC processing fibres, de-inking waste paper and improving the freeness of
CC paper pulp - which is particularly applicable in detergent compositions.
CC The present DNA sequence represents an endoglucanase-related gene
CC sequence of the invention.
XX
SQ Sequence 1083 BP; 260 A; 297 C; 231 G; 295 T; 0 other;

Query Match 34.2%; Score 398.6; DB 24; Length 1083;
Best Local Similarity 65.6%; Pred. No. 1.9e-107;
Matches 662; Conservative 0; Mismatches 284; Indels 63; Gaps 3;



RESULT 9
AAA62727
ID AAA62727 standard; DNA; 1101 BP.
XX
AC AAA62727;
XX
DT 25-SEP-2000 (first entry)
XX
DE Endoglucanase nucleotide sequence 2.
XX
KW Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KW animal foodstuff; ss.
XX
OS Rhizopus oryzae.
XX
PN WO200024879-A1.
XX
PD 04-MAY-2000.
XX
PF 25-OCT-1999; 99WO-JP05884.
XX
PR 23-OCT-1998; 98JP-0302387.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;
PI Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;
XX
DR WPI; 2000-365117/31.
DR P-PSDB; AAB09822.
XX
PT Endoglucanases of fungal origin with high activity under alkaline
PT conditions for production of paper pulp and animal feedstuffs -
XX
PS Claim 44; Page 108-110; 180pp; Japanese.
XX
CC This sequence encodes an endoglucanase protein. The invention relates
CC to an endoglucanase of fungal origin which can completely break down
CC purified cellulose at a concentration of less than 1mg protein/litre,
CC and produces more than 50% breakdown of cellulose at pH 8.5. The
CC invention includes endoglucanase protein sequences (see
CC AAB09825-B09830), endoglucanase nucleotide sequences (see
CC AAA62726-A62732) and primers (AAA62733-A62802) which are used in the
CC identification of the endoglucanase sequences, and in the construction of
CC vectors containing the polynucleotides. The endoglucanase enzymes are
CC used for the production of pulp for papermaking and for the production of
CC animal foodstuffs.
XX
SQ Sequence 1101 BP; 268 A; 258 C; 257 G; 318 T; 0 other;

Query Match 33.5%; Score 390.2; DB 21; Length 1101;
Best Local Similarity 64.2%; Pred. No. 6e-105;
Matches 715; Conservative 0; Mismatches 308; Indels 90; Gaps 5;

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Qy        64 GCTGCTTCTTGCAGCTCTGTCTATGGTCAATGTGGTGGCATTGGCTGGACTGGTCCTACA 123
             ||||||   || |||    | ||||||||||||||||| |  | |||||  ||| |||||
Db        67 GCTGCTAAATGTAGCAAGCTGTATGGTCAATGTGGTGGTAAGGACTGGAATGGCCCTACT 126

Qy       124 TGTTGTGATGCTGGATCGACCTGTAAAGCTCAAAAGGATAACAAATATTATTCTCAATGT 183
             |||||  ||  ||||||| ||||||||||      || |||      || || |||||||||
Db       127 TGTTGCGAATCTGGATCCACCTGTAAAGTAAGCAACGAT------TACTACTCTCAATGT 180

Qy       184 ATTCCCAAACCCAAGGGTTCCTCCTCATCATCATCATGTAGTTCCGTCTATAGTCAATGC 243
              || ||      |       |      || ||   ||||||     | ||| |||||||
Db       181 CTTGCCCCTGAAAGCAACGGCAATAAGTCTTCTGAATGTAGCAAGTTGTATGGTCAATGT 240

Qy       244 GGTGGCATTGGATGGAGTGGACCTACCTGTTGTGAAAGTGGCTCTACTTGCGTTGCTCAA 303
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Db       241 GGTGGTAAGGACTGGAATGGCCCTACTTGTTGCGAATCTGGATCCACCTG------TAAA 294

Qy       304 GAAGGCAACAAATACTACTCTCAATGTCTTCCCGGATCCCACAGTAACAATGCTGGTAAC 363
             | | ||||| | ||||||||||||||||||| ||         || |  ||||     |
Db       295 GTAAGCAACGATTACTACTCTCAATGTCTTGCCCCTGAAAGCAATGGCAATAAAACTTCT 354

Qy       364 GCTAGCAGCACCAAGAAGACATCTACCAAGACATCTACTACCACCGCCAAGGCTACTGCT 423
             |  |||      || | |||  |||||
Db       355 GAAAGCGCTCATAAAACGACTACTACC------------------------------- 381

Qy       424 ACTGTCACCACCAAGACAGTAACCAAGACAACTACCAAGACAACTACCAAGACTAGCACT 483
                                                ||     |  |||   | | ||  |||
Db       382 --------------------------------ACTGCTCCCGCTAAGGAAATTACAACT 408

Qy       484 ACTGCCGCTGCTTCTACTTCCACCTCTTCTTCTGCTGGTTACAAGGTCATCTCTGGCGGT 543
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Db       409 ACTGCCAAAGCTTCAAACTCTTCTAACTCTAGCGGCAAATACTCCATTGTCTCTGGTGGT 468

Qy       544 AAATCTGGCAGTGGTTCCACAACTCGTTATTGGGATTGTTGTAAAGCTTCTTGCAGCTGG 603
                ||||| |  |||  ||| |||||||||||||||||| ||||| || || || ||||||
Db       469 GCCTCTGGTAACGGTGTCACTACTCGTTATTGGGATTGCTGTAAGGCCTCCTGTAGCTGG 528

Qy       604 CCTGGAAAAGCTTCTGTCACTGGTCCTGTTGACACCTGTGCCTCCAATGGTATCTCTTTA 663
             || || || ||   |||||  |  ||||||  |  |||||  |    ||||| || ||
Db       529 CCCGGTAAGGCCAATGTCAGTTCTCCTGTCAAGTCCTGTAACAAAGATGGTGTCACTGCC 588

Qy       664 TTAGATGC---CAATGCTCAAAGTGGTTGTAACGGTGGTAATGGTTTCATGTGTAACAAC 720
               |    ||     |||||  |||||||| ||||||||||||||   ||| ||||||||| ||
Db       589 CTTAGTGACAGCAATGTCCAAAGTGGCTGTAACGGTGGTAACAGTTACATGTGTAACGAC 648

Qy       721 AACCAACCTTGGGCTGTCAATGATGAGCTCGCTTACGGTTTCGCTGCTGCCTCTATTGCT 780
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Db       649 AACCAGCCTTGGGCTGTAAACGATAATCTTGCCTATGGTTTCGCTGCTGCTGCCATCAGT 708

Qy       781 GGCTCCAACGAAGCTGGATGGTGTTGTGGCTGTTATGAATTGACCTTCACTTCTGGCGCT 840
             ||     ||| || | ||||| |||   ||||  ||| | || |||||||||  | ||
Db       709 GGTGGTGGTGAATCTCGCTGGTGCTGTTCTTGTTTCGAACTTACTTTCACTTCTACCTCT 768

Qy       841 GCTTCTGGAAAGAAGATGGTTGTTCAAGTTACCAACACCGGTGGCGATTTAGGCTC---- 896
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Db       769 GTTGCTGGTAAGAAGATGGTTATCCAAGTCACTAACACTGGTGGTGATCTTGGCTCCTCT 828

Qy       897 -----TAACCACTTTGATTTGCAAATGCCCGGTGGTGGCGTTGGTATCTTCAATGGCTGT 951
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Qy       952 GCTGCTCAATGGGGCGCTCCCAATGATGGCTGGGGAGCTAGATATGGTGGTGTCAGCTCT 1011
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Db       889 TCCAAGCAATGGGGTGCTCCCAATGACGGTTGGGGCTCGAGATACGGTGGTATTTCTTCT 948

Qy      1012 GTCTCTGACTGTGCCTCTCTTCCCTCTGCTCTTCAAGCTGGTTGTAAATGGAGATTCAAC 1071
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Qy      1072 TGGTTCAAGAACTCTGATAACCCTACCATGACCTTCAAGGAAGTTACCTGTCCTGCTGAA 1131
             |||||||||||| |||||||||| | |||||| | |||||||||||||||||    |||
Db      1009 TGGTTCAAGAACGCTGATAACCCAAGCATGACTTACAAGGAAGTTACCTGTCCCAAGGAA 1068

Qy      1132 TTAACTACTCGCTCAGGTTGCGAAAGAAAGTAA 1164
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Db      1069 ATCACCGCCAAGACAGGTTGTTCAAGAAAATAA 1101
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RESULT 10
AAL43245
ID AAL43245 standard; DNA; 1101 BP.
XX
AC AAL43245;
XX
DT 22-AUG-2002 (first entry)
XX
DE Rhizopus arrhizus endoglucanase-related coding sequence 2.
XX
KW Zygomycetes-originated endoglucanase; cellulose binding domain;
KW fibre processing; waste paper de-inking; paper pulp; ds; gene.
XX
OS Rhizopus arrhizus.
XX
PN WO200242474-A1.
XX
PD 30-MAY-2002.
XX
PF 21-NOV-2001; 2001WO-JP10188.
XX
PR 21-NOV-2000; 2000JP-0354296.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakane A, Baba Y, Koga J, Kubota H;
XX
DR WPI; 2002-471729/50.
DR P-PSDB; AAO15053.
XX
PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,
PT with effect of endoglucanase activity enhanced in processing fibers,
PT deinking waste paper and improving freeness of paper pulp -
XX
PS Disclosure; Page 60-63; 109pp; Japanese.
XX
CC The invention comprises the amino acid and coding sequences of
CC zygomycetes-originated endoglucanase enzymes lacking the cellulose
CC binding domain. The zygomycetes-originated endoglucanase enzymes of the
CC invention have enhanced endoglucanase activity. The zygomycetes-
CC originated endoglucanase enzymes of the invention are useful for
CC processing fibres, de-inking waste paper and improving the freeness of
CC paper pulp - which is particularly applicable in detergent compositions.
CC The present DNA sequence represents an endoglucanase-related gene
CC sequence of the invention.
XX
SQ Sequence 1101 BP; 268 A; 258 C; 257 G; 318 T; 0 other;

Query Match 33.5%; Score 390.2; DB 24; Length 1101;
Best Local Similarity 64.2%; Pred. No. 6e-105;
Matches 715; Conservative 0; Mismatches 308; Indels 90; Gaps 5;

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Qy        64 GCTGCTTCTTGCAGCTCTGTCTATGGTCAATGTGGTGGCATTGGCTGGACTGGTCCTACA 123
             ||||||   || |||    | ||||||||||||||||| |  | |||||  ||| |||||
Db        67 GCTGCTAAATGTAGCAAGCTGTATGGTCAATGTGGTGGTAAGGACTGGAATGGCCCTACT 126

Qy       124 TGTTGTGATGCTGGATCGACCTGTAAAGCTCAAAAGGATAACAAATATTATTCTCAATGT 183
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Db       127 TGTTGCGAATCTGGATCCACCTGTAAAGTAAGCAACGAT------TACTACTCTCAATGT 180

Qy       184 ATTCCCAAACCCAAGGGTTCCTCCTCATCATCATCATGTAGTTCCGTCTATAGTCAATGC 243
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Db       181 CTTGCCCCTGAAAGCAACGGCAATAAGTCTTCTGAATGTAGCAAGTTGTATGGTCAATGT 240

Qy       244 GGTGGCATTGGATGGAGTGGACCTACCTGTTGTGAAAGTGGCTCTACTTGCGTTGCTCAA 303
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Db       241 GGTGGTAAGGACTGGAATGGCCCTACTTGTTGCGAATCTGGATCCACCTG------TAAA 294

Qy       304 GAAGGCAACAAATACTACTCTCAATGTCTTCCCGGATCCCACAGTAACAATGCTGGTAAC 363
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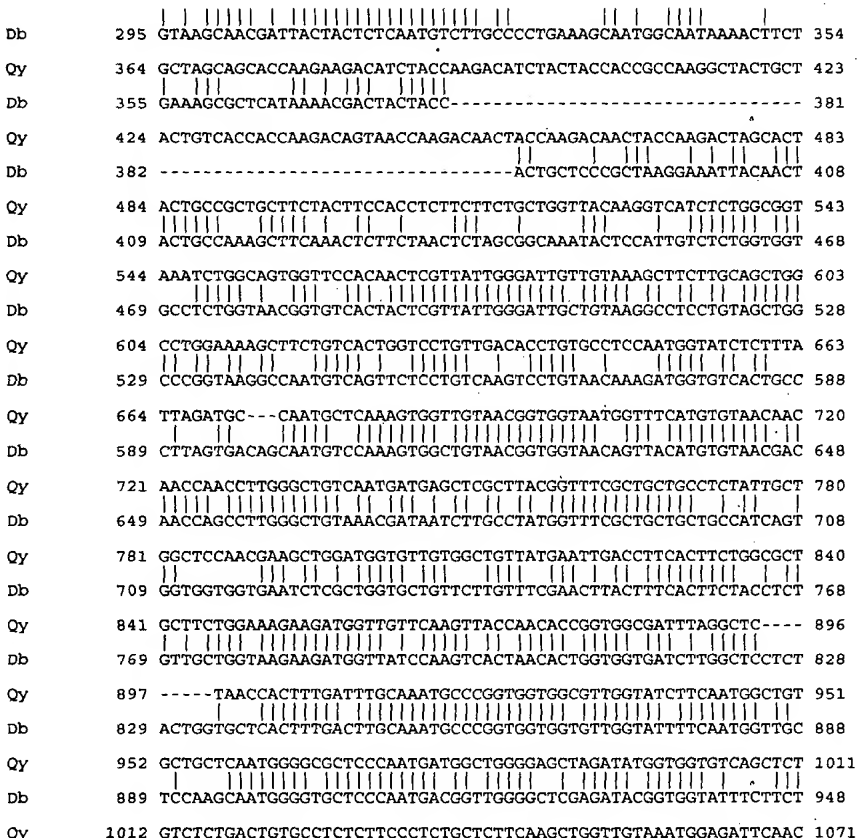

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RESULT 11
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ID   AAA62731 standard; DNA; 1041 BP.
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AC   AAA62731;
XX
DT   25-SEP-2000  (first entry)
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DE   Endoglucanase nucleotide sequence 6.
XX
KW   Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KW   animal foodstuff; ss.
XX
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OS   Phycomyces nitens.
XX
PN   WO200024879-A1.
XX
PD   04-MAY-2000.
XX
PF   25-OCT-1999;  99WO-JP05884.
XX
PR   23-OCT-1998;  98JP-0302387.
XX
PA   (MEIJ ) MEIJI SEIKA KAISHA LTD.
XX
PI   Nakamura Y,  Moriya T,  Baba Y,  Yanai K,  Sumida N,  Nishimura T;
PI   Murashima K,  Nakane A,  Yaguchi T,  Koga J,  Murakami T,  Kono T;
XX
DR   WPI; 2000-365117/31.
DR   P-PSDB; AAB09826.
XX
PT   Endoglucanases of fungal origin with high activity under alkaline
PT   conditions for production of paper pulp and animal feedstuffs -
XX
PS   Claim 44; Page 128-129; 180pp; Japanese.
XX
CC   This sequence encodes an endoglucanase protein. The invention relates
CC   to an endoglucanase of fungal origin which can completely break down
CC   purified cellulose at a concentration of less than 1mg protein/litre,
CC   and produces more than 50% breakdown of cellulose at pH 8.5. The
CC   invention includes endoglucanase protein sequences (see
CC   AAB09825-B09830), endoglucanase nucleotide sequences (see
CC   AAA62726-A62732) and primers (AAA62733-A62802) which are used in the
CC   identification of the endoglucanase sequences, and in the construction of
CC   vectors containing the polynucleotides. The endoglucanase enzymes are
CC   used for the production of pulp for papermaking and for the production of
CC   animal foodstuffs.
XX
SQ   Sequence 1041 BP; 225 A; 352 C; 248 G; 216 T; 0 other;
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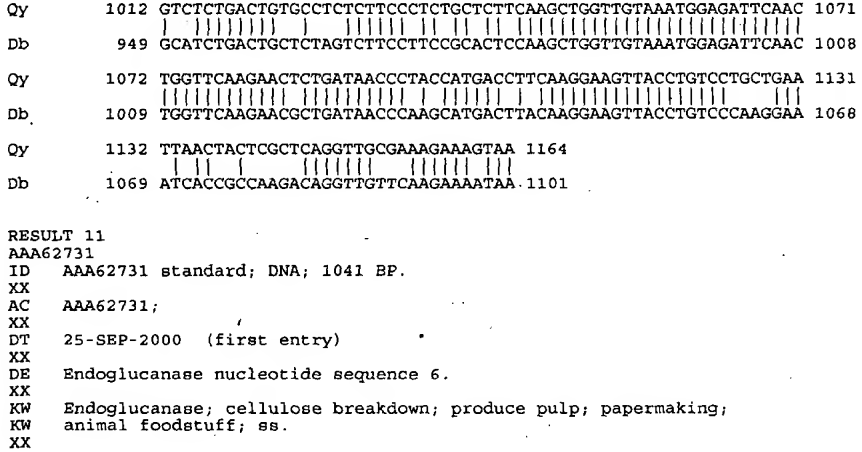
Query Match 32.9%; Score 382.8; DB 21; Length 1041;
Best Local Similarity 62.9%; Pred. No. 9e-103;
Matches 628; Conservative 0; Mismatches 337; Indels 33; Gaps 1;



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Qy        647 CCAATGGTATCTCTTTATTAGATGCCAATGCTCAAAGTGGTTGTAACGGTGGTAATGGTT 706
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Db        524 AGGATGGTGTCAGCCGTCTCGGTTCCGATGTCCAGAGCGGTTGCGTCGGCGGCCAGGCCT 583

Qy        707 TCATGTGTAACAACAACCAACCTTGGGCTGTCAATGATGAGCTCGCTTACGGTTTCGCTG 766
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Db        584 ACATGTGCAATGACAACCAGCCCTGGGTTGTCAATGACGACCTTGCCTACGGTTTCGCTG 643

Qy        767 CTGCCTCTATTGCTGGCTCCAACGAAGCTGGATGGTGTTGTGGCTGTTATGAATTGACCT 826
              |||||  | | | | || ||   |  ||| ||  || || |||||||| ||  | ||||
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Db        704 TCACCAACACTGCTGTCGCTGGCAAGAAGTTTGTCGTCCAGGTCACCAACACCGGTGATG 763

Qy        887 ATTTAGGCTCTAACCACTTTGATTTGCAAATGCCCGGTGGTGGCGTTGGTATCTTCAATG 946
              || |  || | ||||||||||||||||| |||||||| ||||| || ||   ||||||  |
Db        764 ATCTCAGCACCAACCACTTTGATTTGCAGATGCCCGGCGGTGGTGTCGGCTACTTCAACG 823

Qy        947 GCTGTGCTGCTCAATGGGGCGCTCCCAATGATGGCTGGGGAGCTAGATATGGTGGTGTCA 1006
              ||||     | || |||  | |   ||  |||||||||| ||| | ||||| |||| | |
Db        824 GCTGCCAGTCCCAGTGGAACACCAACACCGATGGCTGGGGTGCTCGCTATGGCGGTATTA 883

Qy       1007 GCTCTGTCTCTGACTGTGCCTCTCTTCCCTCTGCTCTTCAAGCTGGTTGTAAATGGAGAT 1066
              ||||| | || || || | |  |||||  |     | || |||||||| || |||||||
Db        884 GCTCTATTTCAGAGTGCGACAAGCTTCCTACCCAGTTGCAGGCTGGTTGCAAGTGGAGAT 943

Qy       1067 TCAACTGGTTCAAGAACTCTGATAACCCTACCATGACCTTCAAGGAAGTTACCTGTCCTG 1126
              ||   |||||||||||| |||| |||||      | ||||||||||  ||||| || ||||
Db        944 TCGGATGGTTCAAGAACGCTGACAACCCAGAGGTCACCTTCAAGGCTGTTACTTGCCCTG 1003

Qy       1127 CTGAATTAACTACTCGCTCAGGTTGCGAAAGAAAGTAA 1164
              | ||  | | | |    | ||||||||  | ||||||
Db       1004 CCGAGATCATTGCCAAGACTGGTTGCGAGCGCAAGTAA 1041
```

RESULT 12
AAL43249
ID AAL43249 standard; DNA; 1041 BP.
XX
AC AAL43249;
XX
DT 22-AUG-2002 (first entry)
XX
DE Phycomyces nitens endoglucanase-related coding sequence.
XX
KW Zygomycetes-originated endoglucanase; cellulose binding domain;
KW fibre processing; waste paper de-inking; paper pulp; ds; gene.
XX
OS Phycomyces nitens.
XX
PN WO200242474-A1.
XX
PD 30-MAY-2002.
XX
PF 21-NOV-2001; 2001WO-JP10188.
XX
PR 21-NOV-2000; 2000JP-0354296.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakane A, Baba Y, Koga J, Kubota H;
XX
DR WPI; 2002-471729/50.
DR P-PSDB; AAO15057.
XX
PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,
PT with effect of endoglucanase activity enhanced in processing fibers,
PT deinking waste paper and improving freeness of paper pulp -
XX
PS Disclosure; Page 81-83; 109pp; Japanese.
XX
CC The invention comprises the amino acid and coding sequences of
CC zygomycetes-originated endoglucanase enzymes lacking the cellulose
CC binding domain. The zygomycetes-originated endoglucanase enzymes of the
CC invention have enhanced endoglucanase activity. The zygomycetes-
CC originated endoglucanase enzymes of the invention are useful for
CC processing fibres, de-inking waste paper and improving the freeness of
CC paper pulp - which is particularly applicable in detergent compositions.
CC The present DNA sequence represents an endoglucanase-related gene
CC sequence of the invention.
XX
SQ Sequence 1041 BP; 225 A; 352 C; 248 G; 216 T; 0 other;

Query Match 32.9%; Score 382.8; DB 24; Length 1041;
Best Local Similarity 62.9%; Pred. No. 9e-103;
Matches 628; Conservative 0; Mismatches 337; Indels 33; Gaps 1;

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Qy        200 GTTCCTCCTCATCATCATCATGTAGTTCCGTCTATAGTCAATGCGGTGGCATTGGATGGA 259
              | ||| | |   |  |   ||| ||    | |||| | || || |||||||     ||||
Db         44 GCTCCACTTACGCTGCTGAATGCAGCCAAGGCTATGGCCAGTGTGGTGGCAAGATGTGGA 103

Qy        260 GTGGACCTACCTGTTGTGAAAGTGGCTCTACTTGCGTTGCTCAAGAAGGCAACAAATACT 319
              ||| || ||||| ||    |||| || || | |   ||| |||| | |  |
Db        104 CTGGTCCCACCTGCACCTCCGGCTTCACCTGTGTAGGTGCCGAAAACAACGAGTGGT 163

Qy        320 ACTCTCAATGTCTTCCCGGATCCCA----------------------------------CA 346
              ||||||| ||| | |||      ||                                  ||
Db        164 ACTCTCAGTGTATCCCCAACGATCAAGTCCAGGGTAACCCCAAGACCACCACCACCACCA 223

Qy        347 GTAACAATGCTGGTAACGCTAGCAGCACCAAGAAGACATCTACCAAGACATCTACTACCA 406
              | ||| ||||  |  | | ||  |        ||  | ||||||  |  | || ||||
Db        224 CCACCAAGGCTGCCACTACCACCAAGGCTCCTGTCACCACCACCAAGGCCACCACCACCA 283

Qy        407 CCGCCAAGGCTACTGCTACTGTCACCACCAAGACAGTAACCAAGACAACTACCAAGACAA 466
              || |||       ||     |||||||||| |    || |  || || |||||||| |
Db        284 CCACCACCAAGGCCCCTGTCACCACCACCAAGGCCACTACTACTACCACCACCAAGACCA 343

Qy        467 CTACCAAGACTAGCACTACTGCCGCTGCTTCTACTTCCACCTCTTCTTCTGCTGGTTACA 526
              | |||||||| | ||| ||    |||||  |  ||  || |||||||     |||| ||||
Db        344 CCACCAAGACCACCACCACCAAGGCTGCCACCACCACCTCCTCTTCCAACACTGGCTACA 403

Qy        527 AGGTCATCTCTGGCGGTAAATCTGGCAGTGGTTCCACAACTCGTTATTGGGATTGTTGTA 586
              |||  |||||  ||     ||||| |  |||  ||| || || || |||||||| || |
Db        404 GCCCCATTTCTGGTGGCTTCTCTGGAAACGGTCGCACTACCCGCTACTGGGATTGCTGCA 463

Qy        587 AAGCTTCTTGCAGCTGGCCTGGAAAAGCTTCTGTCACTGGTCCTGTTGACACCTGTGCCT 646
              | | ||||||  ||||    ||||| |||||||| |||   |||||   ||||||||||
Db        464 AGCCCTCTTGCGCCTGGGACGGAAAGGCTTCTGTAACTAAGCCTGTACTCACCTGTGCCA 523

Qy        647 CCAATGGTATCTCTTTATTAGATGCCAATGCTCAAAGTGGTTGTAACGGTGGTAATGGTT 706
              |||||  ||       | | | || |||  || || |||||   ||| ||  | |  |
Db        524 AGGATGGTGTCAGCCGTCTCGGTTCCGATGTCCAGAGCGGTTGCGTCGGCGGCCAGGCCT 583

Qy        707 TCATGTGTAACAACAACCAACCTTGGGCTGTCAATGATGAGCTCGCTTACGGTTTCGCTG 766
              |||||| ||  |||||||  || |||| |||||||| || || || ||||||||||||
Db        584 ACATGTGCAATGACAACCAGCCCTGGGTTGTCAATGACGACCTTGCCTACGGTTTCGCTG 643

Qy        767 CTGCCTCTATTGCTGGCTCCAACGAAGCTGGATGGTGTTGTGGCTGTTATGAATTGACCT 826
              |||||  | | | | || ||   |  ||| ||  || || |||||||| ||  | ||||
Db        644 CTGCCAGTCTCGGTAGCGCCGGTGCCTCTGCATTCTGCTGCGGCTGTTACGAGCTTACCT 703

Qy        827 TCACTTCTGGCGCTGCTTCTGGAAAGAAGATGGTTGTTCAAGTTACCAACACCGGTGGCG 886
              ||||       ||||   |||| |||||| | || || || || ||||||||||||  |
Db        704 TCACCAACACTGCTGTCGCTGGCAAGAAGTTTGTCGTCCAGGTCACCAACACCGGTGATG 763

Qy        887 ATTTAGGCTCTAACCACTTTGATTTGCAAATGCCCGGTGGTGGCGTTGGTATCTTCAATG 946
              || |  || | ||||||||||||||||| |||||||| ||||| || ||   ||||||  |
Db        764 ATCTCAGCACCAACCACTTTGATTTGCAGATGCCCGGCGGTGGTGTCGGCTACTTCAACG 823

Qy        947 GCTGTGCTGCTCAATGGGGCGCTCCCAATGATGGCTGGGGAGCTAGATATGGTGGTGTCA 1006
              ||||     | || |||  | |   ||  |||||||||| ||| | ||||| ||| | |
Db        824 GCTGCCAGTCCCAGTGGAACACCAACACCGATGGCTGGGGTGCTCGCTATGGCGGTATTA 883

Qy       1007 GCTCTGTCTCTGACTGTGCCTCTCTTCCCTCTGCTCTTCAAGCTGGTTGTAAATGGAGAT 1066
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Db        884 GCTCTATTTCAGAGTGCGACAAGCTTCCTACCCAGTTGCAGGCTGGTTGCAAGTGGAGAT 943

Qy       1067 TCAACTGGTTCAAGAACTCTGATAACCCTACCATGACCTTCAAGGAAGTTACCTGTCCTG 1126

Db        944 TCGGATGGTTCAAGAACGCTGACAACCCAGAGGTCACCTTCAAGGCTGTTACTTGCCCTG 1003

Qy       1127 CTGAATTAACTACTCGCTCAGGTTGCGAAAGAAAGTAA 1164

Db       1004 CCGAGATCATTGCCAAGACTGGTTGCGAGCGCAAGTAA 1041
```

RESULT 13
AAA62732
ID AAA62732 standard; DNA; 1043 BP.
XX
AC AAA62732;
XX
DT 25-SEP-2000 (first entry)
XX
DE Endoglucanase nucleotide sequence 7.
XX
KW Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KW animal foodstuff; ss.
XX
OS Rhizopus oryzae.
XX
PN WO200024879-A1.
XX
PD 04-MAY-2000.
XX
PF 25-OCT-1999; 99WO-JP05884.
XX
PR 23-OCT-1998; 98JP-0302387.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;
PI Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;
XX
DR WPI; 2000-365117/31.
XX
PT Endoglucanases of fungal origin with high activity under alkaline
PT conditions for production of paper pulp and animal feedstuffs -
XX
PS Claim 44; Page 132-134; 180pp; Japanese.
XX
CC This sequence encodes an endoglucanase protein. The invention relates
CC to an endoglucanase of fungal origin which can completely break down
CC purified cellulose at a concentration of less than 1mg protein/litre,
CC and produces more than 50% breakdown of cellulose at pH 8.5. The
CC invention includes endoglucanase protein sequences (see
CC AAB09825-B09830), endoglucanase nucleotide sequences (see
CC AAA62726-A62732) and primers (AAA62733-A62802) which are used in the
CC identification of the endoglucanase sequences, and in the construction of
CC vectors containing the polynucleotides. The endoglucanase enzymes are
CC used for the production of pulp for papermaking and for the production of
CC animal foodstuffs.
XX
SQ Sequence 1043 BP; 212 A; 370 C; 291 G; 170 T; 0 other;

  Query Match   24.3%; Score 283.4; DB 21; Length 1043;
  Best Local Similarity 59.6%; Pred. No. 2.5e-73;
  Matches 564; Conservative   0; Mismatches 356; Indels   27; Gaps   4;

```
Qy        230 TCTATAGTCAATGCGGTGGCATTGGATGGAGTGGACCTACCTGTTGTGAAAGTGGCTCTA 289

Db        101 TCTACGGACAGTGCGGCGGAAAGAACTGGAACGGCCCCACCTGCTGCGAGAGCGGCTCGA 160

Qy        290 CTTGCGTTGCTCAAGAAGGCAACAAATACTACTCTCAATGTCTTCCCGGATCCCACAGTA 349

Db        161 CCTGC------AAGGTCTCGAATGACTACTACAGCCAGTGCCTGCCGAGCGGCTCCTCGG 214

Qy        350 ACAATGCTGGTAACGCTAGCAGCACCAAGAAGACATCTACCAAGACATCTACTACCACCG 409

Db        215 GAAACAAGTCGAGCGAGTCGGCCCACAAGAAGACCACGACC---------GCTGCCCACA 265

Qy        410 CCAAGGCTACTGCTACTGTCACCACCAAGACAGTAACCAAGACAACTACCAAGACAACTA 469

Db        266 AGAAGACCACGACCGCCGCTCACAAGAAGACTACGACCGCTCCCGCCAAGAAGACCACGA 325

Qy        470 CCAAGACTAGCACTACTGCCGCTGCTTCTACTTCCACCTCTTCTTCTGCTGGTTACAAGG 529

Db        326 CCGTCGCCAAGGCTTCGACTCCGTCCAACTCGAGCAGCTCGTCTTCGGGAAAGTACAGCG 385

Qy        530 TCATCTCTGGCGGTAAATCTGGCAGTGGTTCCACAACTCGTTATTGGGATTGTTGTAAAG 589

Db        386 CTGTCAGCGGTGGCGCTAGCGGCAACGGCGTCACTACCCGCTACTGGGACTGCTGCAAGG 445

Qy        590 CTTCTTGCAGCTGGCCTGGAAAAGCTTCTGTCACTGGTCCTGTTGACACCTGTGCCTCCA 649

Db        446 CTTCGTGCTCGTGGCCCGGCAAGGCTAACGTCAGCTCGCCTGTCAAGTCCTGCAACAAGG 505

Qy        650 ATGG---TATCTCTTTATTAGATGCCAATGCTCAAAGTGGTTGTAACGGTGGTAATGGTT 706

Db        506 ACGGCGTCACCGCTCTTAGCGACTCCAACGCCCAGTCCGGCTGCAACGGCGGCAACTCCT 565

Qy        707 TCATGTGTAACAACAACCAACCTTGGGCTGTCAATGATGAGCTCGCTTACGGTTTCGCTG 766

Db        566 ACATGTGCAACGACAACCAGCCATGGGCTGTCAACGACAACCTTGCTTACGGTTTCGCTG 625

Qy        767 CTGCCTCTATTGCTGGCTCCAACGAAGCTGGATGGTGTTGTGGCTGTTATGAATTGACCT 826

Db        626 CCGCTGCCATTAGCGGCGGTGGCGAGAGCCGCTGGTGCTGCTCCTGCTTCGAGCTCACCT 685

Qy        827 TCACTTCTGGCGCTGCTTCTGGAAAGAAGATGGTTGTTCAAGTTACCAACACCGGTGGCG 886

Db        686 TCACCTCCACCAGCGTTGCTGGCAAGAAGATGGTCGTCCAGGTCACCAACACTGGCGGTG 745

Qy        887 ATTTAGG---------CTCTAACCACTTTGATTTGCAAATGCCCGGTGGTGGCGTTGGTA 937

Db        746 ACCTTGGCAGCTCGACCGGTGCCCACTTCGATCTCCAGATGCCCGGCGGCGGCGTCGGCA 805

Qy        938 TCTTCAATGGCTGTGCTGCTCAATGGGGCGCTCCCAATGATGGCTGGGGAGCTAGATATG 997

Db        806 TCTTCAACGGATGCTCGTCCCAGTGGGGCGCTCCCAACGACGGCTGGGGCTCGCGCTACG 865

Qy        998 GTGGTGTCAGCTCTGTCTCTGACTGTGCCTCTCTTCCCTCTGCTCTTCAAGCTGGTTGTA 1057

Db        866 GCGGCATCAGCTCCGCCAGCGACTGCTCGTCCCTCCCCAGCGCCCTCCAGGCCGGCTGCA 925

Qy       1058 AATGGAGATTCAACTGGTTCAAGAACTCTGATAACCCTACCATGACCTTCAAGGAAGTTA 1117

Db        926 AGTGGCGCTTCAACTGGTTCAAGAACGCCGACAACCCGTCCATGACCTACAAGGAGGTCA 985

Qy       1118 CCTGTCCTGCTGAATTAACTACTCGCTCAGGTTGCGAAAGAAAGTAA 1164

Db        986 CCTGCCCCAAGGAGATCACCGCTAAGACCGGATGCTCGCGCAAGTAA 1032
```

RESULT 14
AAL43250
ID AAL43250 standard; DNA; 1043 BP.
XX
AC AAL43250;
XX
DT 22-AUG-2002 (first entry)
XX
DE Rhizopus arrhizus endoglucanase-related codon-optimised DNA sequence.
XX
KW Zygomycetes-originated endoglucanase; cellulose binding domain;
KW fibre processing; waste paper de-inking; paper pulp; ds; gene.
XX
OS Rhizopus arrhizus.
OS Synthetic.
XX

PN WO200242474-A1.
XX
PD 30-MAY-2002.
XX
PF 21-NOV-2001; 2001WO-JP10188.
XX
PR 21-NOV-2000; 2000JP-0354296.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakane A, Baba Y, Koga J, Kubota H;
XX
DR WPI; 2002-471729/50.
DR P-PSDB; AAO15052.
XX
PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,
PT with effect of endoglucanase activity enhanced in processing fibers,
PT deinking waste paper and improving freeness of paper pulp -
XX
PS Example 10; Page 84-86; 109pp; Japanese.
XX
CC The invention comprises the amino acid and coding sequences of
CC zygomycetes-originated endoglucanase enzymes lacking the cellulose
CC binding domain. The zygomycetes-originated endoglucanase enzymes of the
CC invention have enhanced endoglucanase activity. The zygomycetes-
CC originated endoglucanase enzymes of the invention are useful for
CC processing fibres, de-inking waste paper and improving the freeness of
CC paper pulp - which is particularly applicable in detergent compositions.
CC The present DNA sequence represents an endoglucanase-related gene
CC sequence of the invention.
XX
SQ Sequence 1043 BP; 212 A; 370 C; 291 G; 170 T; 0 other;

Query Match 24.3%; Score 283.4; DB 24; Length 1043;
Best Local Similarity 59.6%; Pred. No. 2.5e-73;
Matches 564; Conservative 0; Mismatches 356; Indels 27; Gaps 4;

```
Qy        230 TCTATAGTCAATGCGGTGGCATTGGATGGAGTGGACCTACCTGTTGTGAAAGTGGCTCTA 289
              ||||  | || ||||| || |      ||||  || || ||||| || || || ||||| |
Db        101 TCTACGGACAGTGCGGCGGAAAGAACTGGAACGGCCCCACCTGCTGCGAGAGCGGCTCGA 160

Qy        290 CTTGCGTTGCTCAAGAAGGCAACAAATACTACTCTCAATGTCTTCCCGGATCCCACAGTA 349
              | |||      | |     ||  | ||||||   || || || ||  |   | .|
Db        161 CCTGC------AAGGTCTCGAATGACTACTACAGCCAGTGCCTGCCGAGCGGCTCCTCGG 214

Qy        350 ACAATGCTGGTAACGCTAGCAGCACCAAGAAGACATCTACCAAGACATCTACTACCACCG 409
                ||       | ||        |  |||||||||  | |||          || ||  |
Db        215 GAAACAAGTCGAGCGAGTCGGCCCACAAGAAGACCACGACC---------GCTGCCCACA 265

Qy        410 CCAAGGCTACTGCTACTGTCACCACCAAGACAGTAACCAAGACAACTACCAAGACAACTA 469
              |||  | ||  |  | |     ||  |||||    |||     |  | |  ||||| || |
Db        266 AGAAGACCACGACCGCCGCTCACAAGAAGACTACGACCGCTCCCGCCAAGAAGACCACGA 325

Qy        470 CCAAGACTAGCACTACTGCCGCTGCTTCTACTTCCACCTCTTCTTCTGCTGGTTACAAGG 529
              ||    | |   || |  |  |  |     |  || ||| |||||  |     ||||  |
Db        326 CCGTCGCCAAGGCTTCGACTCCGTCCAACTCGAGCAGCTCGTCTTCGGGAAAGTACAGCG 385

Qy        530 TCATCTCTGGCGGTAAATCTGGCAGTGGTTCCACAACTCGTTATTGGGATTGTTGTAAAG 589
                ||   || ||       ||||  ||   ||| || || || ||||| || || || |
Db        386 CTGTCAGCGGTGGCGCTAGCGGCAACGGCGTCACTACCCGCTACTGGGACTGCTGCAAGG 445

Qy        590 CTTCTTGCAGCTGGCCTGGAAAAGCTTCTGTCACTGGTCCTGTTGACACCTGTGCCTCCA 649
              |||| |||   ||||| || || |||   ||||      |||||   |  ||||   |
Db        446 CTTCGTGCTCGTGGCCCGGCAAGGCTAACGTCAGCTCGCCTGTCAAGTCCTGCAACAAGG 505

Qy        650 ATGG---TATCTCTTTATTAGATGCCAATGCTCAAAGTGGTTGTAACGGTGGTAATGGTT 706
              | ||    | | || |    ||  |||| || ||    || || ||||| || ||    |
Db        506 ACGGCGTCACCGCTCTTAGCGACTCCAACGCCCAGTCCGGCTGCAACGGCGGCAACTCCT 565

Qy        707 TCATGTGTAACAACAACCAACCTTGGGCTGTCAATGATGAGCTCGCTTACGGTTTCGCTG 766
              |||||| ||| ||||||| || ||||||||||| ||  | || ||||||||||||||||
Db        566 ACATGTGCAACGACAACCAGCCATGGGCTGTCAACGACAACCTTGCTTACGGTTTCGCTG 625

Qy        767 CTGCCTCTATTGCTGGCTCCAACGAAGCTGGATGGTGTTGTGGCTGTTATGAATTGACCT 826
              | ||  | |||   |||      |||       | ||||| ||   ||| |  ||  | ||||
Db        626 CCGCTGCCATTAGCGGCGGTGGCGAGAGCCGCTGGTGCTGCTCCTGCTTCGAGCTCACCT 685

Qy        827 TCACTTCTGGCGCTGCTTCTGGAAAGAAGATGGTTGTTCAAGTTACCAACACCGGTGGCG 886
              |||| ||   |   | | |||| |||||||||| || || || |||||||| || || |
Db        686 TCACCTCCACCAGCGTTGCTGGCAAGAAGATGGTCGTCCAGGTCACCAACACTGGCGGTG 745

Qy        887 ATTTAGG---------CTCTAACCACTTTGATTTGCAAATGCCCGGTGGTGGCGTTGGTA 937
              |  | ||         |  |  |||||| ||| | || ||||||| || ||||| || |
Db        746 ACCTTGGCAGCTCGACCGGTGCCCACTTCGATCTCCAGATGCCCGGCGGCGGCGTCGGCA 805

Qy        938 TCTTCAATGGCTGTGCTGCTCAATGGGGCGCTCCCAATGATGGCTGGGGAGCTAGATATG 997
              ||||||| || ||   |  | || |||||||||||||| || ||||||||   |  | || |
Db        806 TCTTCAACGGATGCTCGTCCCAGTGGGGCGCTCCCAACGACGGCTGGGGCTCGCGCTACG 865

Qy        998 GTGGTGTCAGCTCTGTCTCTGACTGTGCCTCTCTTCCCTCTGCTCTTCAAGCTGGTTGTA 1057
              | ||  |||||| | | |   |||||  | || || |||   || || || || || || |
Db        866 GCGGCATCAGCTCCGCCAGCGACTGCTCGTCCCTCCCCAGCGCCCTCCAGGCCGGCTGCA 925

Qy       1058 AATGGAGATTCAACTGGTTCAAGAACTCTGATAACCCTACCATGACCTTCAAGGAAGTTA 1117
              | ||| | |||||||||||||||||| | || |||||  |||||||| |||||| || |
Db        926 AGTGGCGCTTCAACTGGTTCAAGAACGCCGACAACCCGTCCATGACCTACAAGGAGGTCA 985

Qy       1118 CCTGTCCTGCTGCAATTAACTACTCGCTCAGGTTGCGAAAGAAAGTAA 1164
              |||| ||    ||  | ||  ||    | || |||    | ||||||
Db        986 CCTGCCCCAAGGAGATCACCGCTAAGACCGGATGCTCGCGCAAGTAA 1032
```

RESULT 15
AAV16105
ID AAV16105 standard; cDNA; 984 BP.
XX
AC AAV16105;
XX
DT 21-JUL-1998 (first entry)
XX
DE Fusarium oxysporum non-surface-active endoglucanase gene.
XX
KW endoglucanase; non-surface-active; cellulase; detergent; cleaning;
KW performance; stain removal; soften; feel; colour; ss.
XX
OS Fusarium oxysporum.
XX
FH Key Location/Qualifiers
FT CDS 97..735
FT /*tag= a
FT /product= "endoglucanase"
XX
PN WO9804663-A1.
XX
PD 05-FEB-1998.
XX
PF 25-JUL-1997; 97WO-US13194.
XX
PR 30-JUL-1996; 96US-0023125.
XX
PA (PROC) PROCTER & GAMBLE CO.
XX
PI Boyer SL;
XX
DR WPI; 1998-130664/12.
DR P-PSDB; AAW46619.
XX
PT Detergent composition containing both surface-active and non-surface
PT active cellulase - softens and improves feel of cotton fabrics
PT without causing loss in weight or tensile strength
XX
PS Disclosure; Pages 54-56; 68pp; English.
XX
CC The sequence is that encoding the endoglucanase enzyme of a non
CC surface-active cellulase produced by Fusarium. The enzyme can be
CC used in a detergent composition with a surface-active

CC cellulase. This combination improves cleaning performance
CC (maintains colours and removes stains), and softens and
CC improves the feel of cotton fabrics without causing losses in
CC weight or tensile strength.
XX
SQ Sequence 984 BP; 229 A; 270 C; 227 G; 258 T; 0 other;

Query Match 19.0%; Score 221.4; DB 19; Length 984;
Best Local Similarity 63.9%; Pred. No. 5.8e-55;
Matches 371; Conservative 0; Mismatches 201; Indels 9; Gaps 2;

```
Qy       547 TCTGGCAGTGGTTCCACAACTCGTTATTGGGATTGTTGTAAAGCTTCTTGCAGCTGGCCT 606
Db       151 TCTGGAAGCGGTCACTCTACTCGATACTGGGATTGCTGCAAGCCTTCTTGCTCTTGGAGC 210

Qy       607 GGAAAAGCTTCTGTCACTGGTCCTGTTGACACCTGTGCCTCCAATGGTATCTCTTTATTA 666
Db       211 GGAAAGGCTGCTGTCAACGCCCCTGCTTTAACTTGTGATAAGAACGACAACCCCATTTCC 270

Qy       667 GATGCCAATGCTCAAAGTGGTTGTAA---CGGTGGTAATGGTTTCATGTGTAACAACAAC 723
Db       271 AACACCAATGCTGTCAACGGTTGTGAGGGTGGTGGTTCTGCTTATGCTTGCACCAACTAC 330

Qy       724 CAACCTTGGGCTGTCAATGATGAGCTCGCTTACGGTTTCGCTGCTGCCTCTATTGCTGGC 783
Db       331 TCTCCCTGGGCTGTCAACGATGAGCTTGCCTACGGTTTCGCTGCTACCAAGATCTCCGGT 390

Qy       784 TCCAACGAAGCTGGATGGTGTTGTGGCTGTTATGAATTGACCTTCACTTCTGGCGCTGCT 843
Db       391 GGCTCCGAGGCCAGCTGGTGCTGTGCTTGCTATGCTTTGACCTTCACCACTGGCCCCGTC 450

Qy       844 TCTGGAAAGAAGATGGTTGTTCAAGTTACCAACACCGGTGGCGATTTAGGCTCTAACCAC 903
Db       451 AAGGGCAAGAAGATGATCGTCCAGTCCACCAACACTGGAGGTGATCTCGGCGACAACCAC 510

Qy       904 TTTGATTTGCAAATGCCCGGTGGTGGCGTTGGTATCTTCAATGGCTGTGCTGCTCAATGG 963
Db       511 TTCGATCTCATGATGCCCGGCGGTGGTGTCGGTATCTTCGACGGCTGCACCTCTGAGTTC 570

Qy       964 GGCGCTCCCAATGATGGCTGGGGAGCTAGATATGGTGGTGTCAGCTCTGTCTCTGACTGT 1023
Db       571 GG------CAAGGCTCTCGGCGGTGCCCAGTACGGCGGTATCTCCTCCCGAAGCGAATGT 624

Qy      1024 GCCTCTCTTCCCTCTGCTCTTCAAGCTGGTTGTAAATGGAGATTCAACTGGTTCAAGAAC 1083
Db       625 GATAGCTACCCCGAGCTTCTCAAGGACGGTTGCCACTGGCGATTCGACTGGTTCGAGAAC 684

Qy      1084 TCTGATAACCCTACCATGACCTTCAAGGAAGTTACCTGTCC 1124
Db       685 GCCGACAACCCTGACTTCACCTTTGAGCAGGTTCAGTGCCC 725
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Search completed: June 17, 2003, 11:49:16
Job time : 258.88 secs